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DSH ABSTRACTS

HEARING

ANATOMY AND PHYSIOLOGY

1041. ARSLAN, M., *The innervation of the middle ear. Proc. roy. Soc. Med.*, 53, 1960, 1068-1074.

With several co-workers, the author states "Our aim was: (a) To produce evidence of the real nature of some nerves existing in the middle ear. (b) To clarify the function of the twigs of the tympanic nerve, connecting it with the carotid plexus and the system of the petrosal nerves. (c) To establish the relationship between the somatic and the autonomic nerves of the middle ear." Embryonic material was used, from which detailed descriptions of the anatomic features of the following are presented: the tympanic nerves, the nervous ganglia of the middle ear, the sympathetic nervous supply of the middle ear, the innervation of the middle ear muscles, and the innervation of the tympanic membrane. Numerous drawings and photographs supplement the text. The author concludes that a number of important problems remain unanswered but that "The middle ear is the most important point of confluence and crossing of different nerves in the head, a fact which proves the high functional and regulating importance of the auditory organ." (J.L.S.)

1042. BAKAN, P., *Effect of meprobromate on auditory vigilance. Percept. Mot. Skills*, 1961, 12, 26.

16 male undergraduates were assigned to two equated groups of eight on the basis of pretest results on an auditory vigilance task. Each member in the drug group received a 400 mg capsule of meprobromate; in the other group, a placebo. Each individual was given a vigilance task of listening for 48 minutes to a series of digits and recording a response whenever he heard a specific pattern of digits. No statistical differences were found between the two groups. (A.R.)

1043. BELLUCCI, R. J., and WOLFF, D., *Tissue reaction following reconstruction of the oval window in experimental*

animals. Ann. Otol. Rhinol. Laryngol., 70, 1961, 64-80.

Ten stapedectomies were performed in nine cats. The stapes was replaced by a sibling stapes, by a fresh homologous stapes (not sibling), by a bank stapes, by an autogenous incus, or by a fresh incus from another cat. Homologous stapes were viable in the host environment, and in at least one cat the stapedius tendon adhered to a foreign stapes in spite of heavy infection in the middle ear. Ankylosis and labyrinthine defects noted clinically or histologically in some animals were attributed to surgical or infectious problems rather than to tissue reaction. (R.G.)

1044. CHAMBERS, A. H., and LUCINA, G. G., *Effects on round window potentials of localized changes in cochlear temperature. Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 698-710.

Cochlear potentials were recorded at the round window of cats after localized cooling and heating at particular turns of the cochlea *in situ*. Cochlear potentials elicited by various frequencies were depressed to different degrees, and the pattern of this depression changed with the cochlear region cooled. Recovery took place shortly after removal of the coolant. (P.A.Y.)

1045. CUTT, R. A., and GULICK, W. L., *The effects of abnormal body temperature upon the ear: hearing. Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 997-1005.

An increase in the body temperature of the guinea pig causes a reduction in the electrical response of the cochlea. . . . The body temperature of four animals was raised until each expired due to hyperthermia, and three others were used to study recovery. On the basis of this study the following conclusions are offered: (a) Hyperthermic body temperatures decrease the magnitude of the cochlear response. The more severe the temperature deviation, the greater is the loss. (b) Hyperthermia reduces sensitivity, but the form of the intensity function over the greater part of its course is essentially unaltered.

(c) No significant recovery was observed following hyperthermia (41° C). (d) The range of body temperatures within which the response seems to remain relatively constant is rather extensive (32 to 40° C). (Authors' summary)

1046. DAVIS, H. Some highlights of science in otology. *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 18-30.

Contributions to the basic knowledge of auditory function from otologic observations and studies are discussed. Personal reminiscences of some of the pioneers in the field are related. (R.G.)

1047. FUSARI, C., and VAGLINI, F. Rilievi audiometrici, vestibolari ed ematologici in soggetti esposti al rumore di turbo-reattori. Parte III: Osservazioni ematologiche. (Audiometric, vestibular and blood tests in jet-engine workers. III: Blood tests.) *Bol. Mal. Or., Gola, Naso*, 78, 1960, 679-687.

In 30 normal subjects, by means of ematic eosinophiles count, the authors studied the action of jet-engine noise on neuro-endocrine system. The subjects, divided into three groups of 10 persons, have been exposed to the jet-noise respectively for 10 sec, 20 sec, 30 sec. The authors observed in every person, even after a short period of [exposure] to the noise, a numeric decrease of eosinophiles (average 61.2-61.5%). According to the opinion that a decrease of eosinophiles corresponds to the presence of stress and stimulation of [the adrenal cortex], such results confirm the compromission of neuro-endocrine system in subjects exposed to the acoustic stress from jet-engine noise. (Authors' summary)

1048. GALIOTO, G. B., and ALIA, E. Ulteriori ricerche sull'architettura degli ossicini dell'orecchio. (Research on ear ossicles structure.) *Bol. Mal. Or., Gola, Naso*, 78, 1960, 735-741.

The authors study the microscopical structure in 150 ossicles of subjects from three months to 88 years of age. On the basis of their own research the authors state that the middle ear ossicles show a canalicular structure (which they describe) with a peculiar disposition probably correlated to the mechanical function. (Authors' summary)

1049. HALLPIKE, C. S., and PFALTZ, C.R. The effects upon vestibular function in the cat of unilateral destruction of the nucleus fastigii. *Proc. roy. Soc. Med.*, 53, 1960, 1064-1067.

Three cats were used in the experiment described by the authors. Electrolytic destruction of either the right or left nucleus fastigii was in each case confirmed by histological examination. Following recovery from the operation the cats were observed for spontaneous positional nystagmus. In two cats no significant nystagmus occurred at all, and in the third some nystagmus noted on the day following the operation was attributed to electrolytic lesion which extended into white matter surrounding the destroyed nucleus fastigii. The authors conclude their experiments indicate positional nystagmus is not a result of lesions in the nucleus fastigii. (J.L.S.)

1050. HARRIS, A. J. Experimental findings following the stapes replacement procedure. *Laryngoscope*, 71, 1961, 131-148.

Stapedectomy and stapes replacement can be carried out in cats, using the gel-foam and polyethylene strut technique without demonstrable microscopic changes in the inner and middle ear postoperatively. Apparently the presence of the foreign materials per se does not stimulate fibrosis. Fibrosis in the middle ear in cats appears to be the result of invasion of fibrous tissue through the atticotomy defect and can occur in the absence of sepsis or inflammation. There is no apparent correlation between fibrosis in the middle ear and inner ear damage. The membrane formed over the oval window after a stapes replacement procedure is apparently a barrier to fibrous tissue invasion of the inner ear; however, it does not prevent the invasion of an infection into the labyrinth. Inner ear changes are found to occur in the presence of postoperative sepsis and undue surgical trauma over the oval window area. Trauma over the oval window area is capable of producing degeneration of the receptor cells in the saccule and utricle, as well as destruction of the organ of Corti, and spiral ganglion degeneration. (Author's summary)

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1051. KOIDE, Y., TAJIMA, S., YOSHIDA, M., and KONNO, M., Biochemical changes in the inner ear induced by insulin, in relation to the cochlear microphonics. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 1083-1097.

Cochlear microphonics were recorded from guinea pigs and rabbits after the administration of large dosages of insulin. Depressions in cochlear responses were obtained, but recovered with the administration of glucose, pyruvate or fumarate, as well as various vasodilating agents. Oxygen tension in the cochlea was also decreased by the insulin dosage. It was concluded that "the cochlear microphonics do not diminish in amplitude until the oxygen tension falls below the critical level." (P.A.Y.)

1052. MANGABEIRA-ALBERNAZ, P. L., Histochemistry of the connective tissue of the cochlea. *Laryngoscope*, 71, 1961, 1-18.

(a) The limbus spiralis is a structure containing small amounts of irregularly distributed acid mucopolysaccharides. They show a tendency to accumulate in the proximity of the vestibular margin of the limbus or in the vicinity of attachment of Reissner's membrane. (b) The acid mucopolysaccharides in the limbus are diminished in cochleas of animals subjected to intense sound exposures. Regeneration in animals with prolonged post-exposure lives does not occur. (c) The scala vestibuli portion of the spiral ligament is rich in homogeneously distributed acid mucopolysaccharides. In the scala tympani portion they are present in smaller amounts, and their distribution is irregular. (d) The appearance of degenerative changes in the limbus spiralis and spiral ligament after exposure of animals' ears to intense sound seems to bear a relation to the areas containing smaller amounts of acid mucopolysaccharides. (Author's summary)

1053. McLELLAN, M. S., and WEBB, C. H., Ear studies in the newborn infant. *J. Pediatrics*, 58, 1961, 523-527.

Normal landmarks in the immediate postnatal period are described. New features described are dorsal and ventral "fireballs," spokelike markings, and a dorsal gray area. Progressive spontaneous clearing of vernix is noted. Ear drums become less

reddened after first 24 hours. Ear drums are pinker and landmarks less distinct than in older child. (N.J.C.)

1054. MISKOLCZY-FODOR, F., Electronystagmographic studies of vestibular function: IV. Investigation of the behavior and significance of various nystagmus qualities for the determination of normal vestibular reaction. *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 176-193.

(a) The pattern of various qualities of reactive nystagmus in response to a specific stimulation is investigated in 40 normal ears. The frequency, amplitude, and turning-speed curves are determined together with average normal values and normal scatter. With further treatment of these curves, three summarizing quantities are defined: total duration, total turning of nystagmus, and total number of nystagmus beats. The method of obtaining these values through nystagmography is discussed. (b) The determined turning-speed, plotted as a function of nystagmus duration, presents a fairly stable and characteristic curve. The amplitude and frequency of nystagmus are integrated in this curve and their interdependent variations are equalized. (c) It appears that the graph of the turning-speed curve, named vestibulogram, is suitable for a simplified definition of the magnitude of any induced and spontaneous vestibular reaction. The vestibulogram describes the nystagmic response in two dimensions on its time axis, the total duration of nystagmus is only one component of the vestibular reaction, while the height of the curve, indicating the intensity of nystagmus, seems to be an equally important trait. (d) The magnitude of any vestibular response appears to be defined by the area bounded by the turning-speed curve. This is called total turning (total amplitude). It indicates the number of degrees which would theoretically occur if the slow nystagmus component consisted of a continuous eye rotation. (e) The vestibulogram demonstrates typical curves for normal caloric reaction, the average normal values of which are discussed. (Author's summary)

1055. MURPHY, J. E., and HARRIS, J. D., Negligible effects of X-radiation of the head upon hearing in the rat. *J. aud. Res.*, 1, 1961, 117-132.

Groups of white rats were trained to press a lever for food during the periods when an otherwise constant tone of 4 kc was modulated in a sinusoidal fashion either 4 db in intensity or 4% in frequency. Other rats were trained to respond in a shuttlebox to the onset of modulation. At a stage in his acquisition curve, an individual rat was given a single dose of 200 r [roentgens] directed toward the rear half of the skull. No effect on the learning curves could be observed, whereupon the dose was changed to 500 r. Rats given this larger dose were able to maintain both lever-pressing and shuttlebox habits, though a few days after X-radiation at 500 r the shuttlebox habit showed some deterioration for both types of modulation. A dose of 500 r had no effect on the audiogram as measured by the Preyer pinna reflex, nor upon the 1 μ v cochleogram as compared with the average normal untreated rat. If a deterioration occurred in the shuttlebox situation the effect was not primarily on the peripheral sense organ. (*Authors' summary*)

1056. NIEDER, P. C., and NEFF, W. D., Auditory information from subcortical electrical stimulation in cats. *Science*, 133, 1961, 1010-1011.

Animals trained to respond to sound stimuli were found to perform the learned response when they were electrically stimulated through electrodes chronically implanted in subcortical structures of the auditory pathway. Other animals trained to respond to electrical stimulation of subcortical auditory structures showed differential transfer effects depending on the positions of the stimulating electrodes. (*F.B.R.*)

1057. NOMURA, Y., Capillary permeability of the cochlea. An experimental study. *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 81-101.

Permeability of the cochlear vessels is studied with the aid of vital staining of the guinea pig. In the stria vascularis, a high potential-barrier exists between the blood and the tissue. The restriction of the escape of dye from the blood in the stria vascularis is more prominent than that in the brain. This is probably favorable to maintaining the components of the endo-

lymph constant. The stria vascularis possesses the function of disposing of foreign substances and probably of waste products. Phagocytes probably settle in the stria vascularis and play a role in the process. Dye escape hardly occurs in the endolymphatic system whilst it easily occurs in the perilymphatic space especially through the venules in the lower spinal ligament. The sources or origins of the labyrinthine fluids are discussed from the viewpoint of the permeability of the vessels. (*Author's summary*)

1058. PENNETTA, G., and PINTO, F., Ricerche di acustica fisiologica: livello di sensazione come funzione del numero dei recettori in eccitamento. (Research on acoustic physiology: sensation levels and function of a number of sensory cells under stimulation.) *Riv. Audiol. prat.*, 10, 1960, 71-77.

Research has been carried out by means of the fatigue effect to establish the band of sensory cells excited by pure tones of varying frequencies and intensity. The number of neuro-sensorial units under stimuli has been ascertained at different sensation levels. It was found that this number remained unchanged, quite regardless of the input frequency, whereas it increased in proportion to the raising of the sensation level. These results lead to the belief that the intensity discrimination is due to a peripheral mechanism. (*Authors' summary*)

1059. RAHM, W. E., STROTHER, W. F., GULICK, W. L., and CRUMP, J. F., The effects of anesthetics upon the ear. II. Procaine hydrochloride. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 969-975.

The effects on the cochlear response of cats were investigated after applying either normal saline or a 2% solution of procaine hydrochloride to the round window membrane for a 15 minute period. Changes in the magnitude of the response produced by a constant stimulus (1000 cps) were observed over extended periods of time, and intensity functions were plotted immediately before and after application as well as at regular intervals following withdrawal. There were no changes in the magnitude of the cochlear microphonic after application of the normal saline solu-

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tion. After withdrawal of the anesthetic, however, there was an initial drop in response of about 4 db with gradual recovery to normal in a short time. The authors conclude that procaine hydrochloride should be particularly suitable as a local anesthetic for middle ear surgery. (P.A.Y.)

1060. REGER, S. N., Effect of middle ear muscle action on certain psychophysical measurements. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 1179-1198.

The author presents a brief review of the literature relative to intratympanic muscle action in man, with special emphasis to change in loudness due to muscle contraction either voluntarily or in response to the acoustic reflex. A series of experiments done on three trained, normally-hearing subjects are then presented. Equal loudness contours are drawn in response to both pulsed and constant pure-tone and noise stimuli at various supra-threshold intensities in an attempt to demonstrate possible effects of intratympanic muscle contraction on the degree of loudness growth. The results of these experiments are discussed. 20 references. (P.A.Y.)

1061. ROBERTS, L., The cerebral cortex and hearing. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 830-846.

A brief review has been given of the present status of knowledge about the cortical representation of hearing. Cat has been the animal most frequently used. Not only AI, AII, EP and SII but also the temporal and insular areas as well as the suprasylvian and anterior lateral gyri and part of the motor region seem to have auditory representation. Frequency discrimination is not cortically bound, but sound localization and pattern discrimination are affected by cortical lesions. The results obtained in the cat have been confirmed in part in the monkey and to a considerably lesser extent in man. Suggestions are given as regards future research. [30 references.] (Author's summary)

1062. SCHUETTE, D. V., and GULLICK, W. L., The effects of chlorpromazine upon the ear and the VIII cranial nerve. *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 143-163.

The effects of chlorpromazine (5 mg/kg) upon the electrical response of the cochlea and the compound potential of the VIII cranial nerve were observed by recording from the round window membrane of each of five adult guinea pigs. These data were compared with control data obtained from anesthetized and conscious guinea pigs. On the basis of this study the following conclusions are offered. (a) Chlorpromazine depresses body temperature in conscious guinea pigs (3°C) and in anesthetized guinea pigs (10°C). (b) In anesthetized animals chlorpromazine did not produce significant losses in cochlear or N₁ responses as long as the preparation was maintained at normal body temperature. (c) When chlorpromazine was allowed to induce a state of hypothermia, marked losses in cochlear and N₁ responses occurred (up to 32 db). (d) Whether or not recovery occurred seemed to depend upon the duration and severity of hypothermia. (e) Under conditions of equal sub-normal body temperature, the losses noted in the cochlear and N₁ responses were more severe when hypothermia was produced by chlorpromazine than they were when hypothermia was produced by a cold pack. The data were discussed in relation to possible central inhibitory mechanisms, and the direction of further research was indicated. (Authors' summary)

1063. SIMMONS, F. B., Middle ear muscle protection from the acoustic trauma of loud continuous sound. An electrophysiological study in cats. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 1063-1071.

Serial measurements of cochlear microphonic and VIII nerve action potentials were obtained from three groups of cats with electrodes permanently implanted on their round windows. All were exposed to traumatic sound (1 kc for 2 hours at 135 db re: 0.0002 dynes/cm²). Cats exposed awake and with the middle ear muscles intact and active showed considerably less evidence of trauma than did the cats with either (a) the middle ear muscles deactivated by anesthesia, or (b) both middle ear muscles cut weeks before exposure. Action potential showed more depression than did cochlear microphonic in all cats. (Author's summary)

1064. TERKILDTSEN, K., Conduction of sound in the human middle ear. *A.M.A. Arch. Otolaryngol.*, 73, 1961, 69-79.

One way of studying the impedance of the ear drum is through the application of artificial positive or negative pressures. The impedance of the ear drum is changed and at the same time the acuity of hearing is altered. The loss of sensitivity affects chiefly the low tones and is believed related to the stiffness of the ear drum. According to theory sounds will be heard best under conditions where the pressures on both sides of the ear drum are identical and consequently impedance is at a minimum. The purpose of this investigation was to correlate the changes in impedance of the tympanic membrane with concomitant changes in hearing acuity. A method had previously been perfected (Terkildsen & Thomsen, 1959) by which the impedance of the ear drum could be measured exactly under all pressure conditions in the external canal. Individual variations are large because impedance is dependent upon several variables, the stiffness of the drum, the pneumatization of the middle ear and the entire air cell system, and the stiffness of the ossicular chain. Main variation usually takes place inside a range of 20 cm water pressure. For the purposes of this experiment impedances were determined at the minimum corresponding to the level at which the pressure of the middle ear matched the pressure of the canal as well as at a positive pressure of 20 cm of water. The test sound used was 220 cps at approximately 75 db. "During pressure changes in the canal the loudness of the test sound is perceived by the patient as if it is subjected to intensity variations, the maximum loudness being around the point of minimal impedance." Threshold measurements were made by means of a pure tone audiometer which was matched with "an ordinary hearing aid-type telephone." Investigations were limited to 250 and 500 cps, the area in which the largest threshold changes were to be expected. The normal series consisted of 51 ears; the otosclerotic series of 36 ears. In addition five ears were examined with tubal occlusions of long standing. There was considerable individual variation with respect to both threshold shift and change in impedance, but apparently independent of each other. A com-

parison between the normal and otosclerotic series showed smaller threshold shifts among the otosclerotics, i.e., 4 db arithmetic average as compared with 9 db for the normals. No relationship was found between the threshold shift and the size of impedance variations in any of the three series. "Bone conduction thresholds on the other hand always showed a classical maximum loudness zone at the very point of pressure identity on the two sides of the ear drum. . . . The investigations prove that the pressure-sensitive point in the transmission mechanism is the annular ligament at the stapelial footplate and only to an insignificant degree the tympanic membrane." (J.J.)

1065. VAGLINI, F., and FUSARI, C., Rilevi acustici, vestibolari, ed ematologici in soggetti esposti al rumore di turboreattori. Parte I—Rilevi acustici. (Acoustic, vestibular, blood examinations in jet-planes staff. I. Acoustic examinations.) *Bol. Mal. Or., Gola, Naso*, 78, 1960, 626-643.

The authors examine the vestibular and cochlear apparatus and eosinophilia in the blood of jet-planes staff, and they report the audiometric tests of 55 subjects divided in three groups: (a) only one subject hypoacusic among 19 workers with one month to four years of activity; (b) six hypoacusic subjects among 22 workers with four to seven years of activity; (c) three hypoacusic subjects among 14 workers with seven to 10 years of activity. All the normal subjects have been exposed to the noise for 10 sec, and the hearing threshold has been controlled before and after the noise. As a conclusion the authors state (a) only 10 subjects have been found hypoacusic probably because of the discontinuous and relatively short exposition to the sound; (b) the hearing loss is limited to 4,000, 8,000, 11,000 Hz; the low frequencies are seldom damaged; (c) the recruitment is rarely evident; with the Fowler test it is impossible to discover the recruitment because of the symmetric hearing loss; (d) after 10 sec [exposure] to the noise . . . the authors observe less increasing of threshold in the third group. The phenomenon can be explained by a peculiar resistance of the subjects or by [habituation] to the noise. (Authors' summary)

1066. VAGLINI, F., and FUSARI, C., *Rilievi acustici, vestibolari ed ematologici in soggetti esposti al rumore di turboreattori. Parte II—Rilievi vestibolari.* (Acoustic, vestibular and blood tests in jet-engine workers. II. Vestibular tests.) *Bol. Mal. Or., Gola, Naso*, 78, 1960, 671-677.

The authors examine the behavior of vestibular apparatus in 30 subjects. (20 normal and 10 hypoacoustic) daily, at intervals, exposed to jet-engine noise. Every subject has been exposed, in rest condition, to spontaneous nystagmus test in lateral eye position, to Romberg, stair-walking, and Veits tests. 20 subjects (15 normal and 5 hypoacoustic) of the same group have been exposed, 30 minutes after Veits test, to jet-engine noise for 10 sec, and rechecked after 5 sec by means of the same test. The absence of pathological findings correlated with noise effect in the total group (19 subjects with no labyrinthine change) suggests to the authors the conclusion that interrupted noise, even if intense, does not modify the vestibular function. (*Authors' summary*)

1067. WEVER, E. G., and VERNON, J. A., *The protective mechanisms of the bat's ear.* *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 5-17.

The bat is exposed to noise of great intensity for long periods of time during its hunt for insects by echolocation. Three biologic devices help to attenuate the sound reaching the cochlea while still allowing the bat to hear its echo-ranging signals: an auricular folding mechanism, a valve which can close the external auditory meatus, and middle ear muscles which can alter transmission along the ossicular chain. The effectiveness of each of these mechanisms was measured by changes in cochlear potentials, and is described as a function of frequency and as a function of the intensity of sound presented to the contralateral ear. (R.G.)

1068. WEVER, E. G., and VERNON, J. A., *Hearing in the bat, *Myotis lucifugus*, as shown by the cochlear potentials.* *J. aud. Res.*, 1, 1961, 158-175.

The auditory acuity of the little brown bat, *Myotis lucifugus*, was studied by means of recorded cochlear potentials. It was found that, generally, this bat's ear

is less acute than that of other mammals similarly tested, with the exception of restricted, high-frequency peaks. These relatively narrow-range peaks occurred between 10,000 and 60,000 cps. They were most often seen at 40,000 cps. The authors report great care in assuring that the observed sensitivity peaks were not instrumental artifacts. The directionality of the bat's hearing was assessed by noting changes in cochlear potentials as a result of rotating the animal about the vertical axis of the head, thus changing the angle of incidence between a given auricle and a 40,000 cps sound source. A "moderate amount" of directionality was observed. The authors relate their findings to the bats echolocation abilities and report that their findings suggest that echolocation may depend on relatively sharp tuning of the ear for high frequencies, directional effects of the auricle, and multiple-peak tuning of the ear in some bats. (H.B.R.)

APPARATUS AND PROCEDURES

1069. FLETCHER, J. L., *Comparison of the attenuation characteristics of the acoustic reflex and the V51-R earplug.* *J. aud. Res.*, 1, 1961, 111-116.

A comparison is made between the attenuation characteristics of the acoustic reflex (AR), resulting from contraction of the intra-aural muscles, and that caused by the use of a V51-R earplug. Békésy audiograms were obtained from 13 trained Ss prior to and following exposure to 100 rounds fired from a 30 cal. machine gun. This procedure was carried out on each S with no protection, with the AR activated and with V51-R earplugs in place. Results suggest that the magnitude of threshold shift and protection varied widely among individual Ss. Some Ss were unaffected by the noise, even when unprotected. Others appeared to be well protected by both the AR and the plug. Still others were better protected by either the AR or the plug. The AR attenuation was found to be more affective at low, than at high, frequencies, but was clearly present at high frequencies. The author concludes that the use of the AR for protection should be limited to situations where energy is high for low-frequency sound. (H.B.R.)

1070. GIBBY, R. A., An evaluation of AM data system performance by computer simulation. *Bell Syst. Tech. J.*, 39, 1960, 675-704.

The mathematical relationships that describe an amplitude-modulated data system are developed in a form suitable for programming on a high-speed digital computer. These equations contain expressions that specify in general terms the transmission-frequency characteristics of a transmission medium. A data signal composed of a train of raised-cosine shaped pulses is generated in the stimulating process. The simulation provides a means for computing the resulting response of systems to pulse trains. The performance of a double-sideband AM data system is evaluated from measurements of the maximum vertical opening, or aperture, of the eye pattern formed by the received signal. This aperture is related to the system performance in terms of signal-to-noise ratio and error rate of the system. A verification of this technique is made by simulating the conditions of an experimental laboratory data system on the computer and comparing computed and measured performance. (Author's summary.)

1071. OWENS, E. L., An improved amplifier for program circuits. *Bell Lab. Rec.*, 39, 1961, 58-60.

A new, improved program amplifier has been developed. The new program amplifier has input impedances of 150 and 600 ohms for operation with program lines, and 10,000 ohms for "bridging" a line. The output circuit can operate into load impedances of 2, 8, 16, and 600 ohms with internal output impedances of approximately 1/10 of the nominal load impedance. The frequency response is uniform within plus or minus 0.5 db over the range of 20 to 20,000 cps and within plus or minus 0.25 db over the range of 30 to 15,000 cps. The improved transmission characteristics make the amplifier suitable for the highest grade of program service. Its flat frequency response, low harmonic and intermodulation distortion, and high signal-to-noise ratio make its performance satisfactory even in large systems requiring the maximum number of tandem amplifiers. (E.D.S.)

1072. ROGERS, C. L., and WATSON, R. B., Determination of sound absorption coefficients using a pulse technique. *J. acoust. Soc. Amer.*, 32, 1960, 1555-1558.

A pulse method of determination of sound absorption coefficients using a sound mirror to produce directed sound pulses allows determination of the coefficients by essentially a free field method but within the confines of an ordinary laboratory. Average pulse pressures for brief pulses are obtained over both space and time to allow evaluation of the absorption coefficient as a function of angle of incidence. When averaged over angle of incidence, this function leads to an average absorption coefficient. Average coefficients were obtained for samples of two different materials. These coefficients, for a pulse two cycles long at 2000 cps, are 0.56 and 0.182. Comparable values computed from impedance tube data are 0.57 and 0.186; and values obtained from reverberation chamber measurements are 0.57 and 0.130. In each case the three values for each material lie within the estimates of error assigned. It is concluded that while the pulse method is confined to short pulses having relatively wide frequency spectra, the method is useful both in producing values of sound absorption coefficients as a function of angle of incidence and of average values of these coefficients. (Authors' summary.)

1073. STROMSTA, C., and DAWSON, W. L., A continuously variable 360° phase shifter. *J. speech hearing Res.*, 4, 1961, 37-40.

The purpose was to describe a method of shifting audio-voltage phases continuously through 360°. The unit in which the method is applied is both simple and economical to construct. Construction details and circuit characteristics are discussed. (Authors' summary.)

1074. SUNDE, E. D., Pulse transmission by AM, FM and PM in the presence of phase distortion. *Bell Syst. Tech. J.*, 40, 1961, 353-422.

In pulse transmission systems, pulses modulated in various ways to carry information may be transmitted by amplitude, phase or frequency modulation of a carrier, and with each type of modulation various methods of detection are possible.

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An important consideration in many applications is the performance of various modulation and detection methods in the presence of phase distortion or equivalent envelope delay distortion, which may be appreciable in certain transmission facilities. The principal purpose of this presentation is a theoretical evaluation of transmission impairments resulting from certain representative types of delay distortion. These transmission impairments are reflected in the need for increased signal-to-noise ratio at the detector input to compensate for the effect of delay distortion. The performance in pulse transmission by various carrier modulation and detection methods can be formulated in terms of a basic function common to all, known as the carrier pulse transmission characteristic, which is related by a Fourier integral to the amplitude and phase characteristics of the channel. Numerical values are given for the carrier pulse transmission characteristic with linear and quadratic delay distortion, together with the maximum transmission impairments caused by these fairly representative forms of delay distortion with various methods of carrier modulation and signal detection. These include amplitude modulation with envelopes and with synchronous detection, two-phase and four-phase modulation with synchronous detection and with differential phase detection and binary frequency modulation. In determining the effect of delay distortion, a raised cosine amplitude spectrum of the pulses at the detector input has been assumed in all cases, together with the minimum pulse interval permitted with this spectrum and ideal implementation of each modulation and detection method. Furthermore, optimum adjustments from the standpoint of slicing levels and sampling instants at the detector output are assumed for each particular case of delay distortion. These idealizations insure that only the effect of delay distortion is evaluated and considered in comparing modulation methods, and that this effect is minimized by appropriate system adjustments. (*Author's summary*)

1075. WOJCIECHOWSKI, B. M., Theory of a frequency-synthesizing network. *Bell Syst. Tech. J.*, 39, 1960, 649-673.

The theoretical basis for designing fre-

quency-combining and selecting circuits is developed. By the introduction of "side-band algebra" and of a frequency symbolic network, the new method offers formal design procedures in place of intuitive ones. This leads directly to finding optimal solutions for frequency-adding or frequency-subtracting problems without limitations as to the relative frequency ratios. The derivation of typical frequency-synthesizing circuits, such as "slave" oscillators and digital frequency selection systems, is discussed, and examples of practical solutions are given. (*Author's summary*)

AUDITORY SKILLS

1076. VIEHWEG, R., and CAMPBELL, R. A., Localization difficulty in monaurally impaired listeners. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 622-634.

Forty normal hearing subjects and 51 monaurally impaired Ss were given a simple test of localization ability for a short tape-recorded sentence delivered 30 db above the better SRT from a combination of eight positions around the circumference of the Ss head. The following results were found: (a) Normal hearing Ss were able to localize correctly 87% of all test stimuli in quiet and 84% of test stimuli in noise. The area in which normal hearing Ss had most localization difficulty was the rear area. (b) Monaurally impaired Ss demonstrated statistically greater difficulty in locating sound than their normal peers, and as a group, they were able to correctly localize only 44% of all test stimuli in quiet, and 36% when a noise background was introduced. The smallest number of errors was obtained in the area to the side of the good, normal ear, and difficulty in localization became progressively greater in the front, to the side of the impaired ear, and the rear areas. (c) Among monaurally impaired Ss, variations in the amount of difficulty occurring do exist at a statistically significant level. The primary factors which appear to reproduce significant variations are degree of loss and type of loss present. Extreme age groups appear to have greater difficulty localizing sound in noise backgrounds. (d) Ss whose monaural impairments are of congenital origin have essentially the same difficulty in localizing sound as do those who had normal function and

then acquired unilateral impairment. (e) It would appear that the difficulty in localization resulting from the unilateral impairment of auditory function is permanent and does not improve with time. (P.A.Y.)

PSYCHO-ACOUSTICS

1077. FISHER, G. H., Intersensory elements of phenomenal space. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960, Section XXIII, 19.

The psychophysical relationship between physical space and visual experience has been investigated by Luneburg, his general finding being that while "physical" space is linear, "visual" space is parabolic. There is also some evidence which suggests that both auditory and kinaesthetic spaces are non-Euclidian, but the research conducted in these modalities is not so extensive as that in vision. For the purposes of this investigation the three sensory spaces, visual, auditory and kinaesthetic are generalized and called "phenomenal space". Our earlier research led us into a consideration of space perception in "intersensory" conditions in which stimuli in different modalities are mutually localized, this being contrasted with the more usual "pure" conditions using stimuli in the same modality. These experiments suggested that the "intersensory" spaces in the three modalities, visual, auditory and kinaesthetic taken in pairs were not identical. Hence, a stimulus which can be seen, heard and felt may not appear to be in the same place in all three modalities when taken separately or in pairs. However, we are unaware of any conflict arising from this. It is suggested that there may be two ways in which this conflict may be overcome. One, by taking an average of the spatial information from the three modalities, the other, by giving one modality precedence over the others. Experiments are reported which are designed to distinguish between these two mechanisms, and modifications of well-known psychophysical methods are discussed which are designed to overcome some special difficulties arising in experiments of this kind. (Author's summary)

1078. HAWKES, G. R., BAILEY, R. W., and WARM, J. S., Method and modal-

ity in judgments of brief stimulus duration. *J. aud. Res.*, 1, 1961, 133-144.

Relative accuracy and reliability of duration judgments were investigated for auditory, visual and electrical cutaneous stimuli. Methods of production, verbal estimation, and reproduction were used, with stimulus durations of 0.5 to 4.0 sec. Significant differences in judged time were found for modality and interval. Critical ratio tests indicated that auditory judgments did not differ from those based on visual or cutaneous stimuli. The latter two, however, were significantly different from one another. High reliability of judgments was found for all methods and modalities. Method differences reported in other studies were not apparent upon direct comparison using normal [observers], confirming a similar finding reported by Gilliland and Humphreys. It is concluded that the use of duration as a cue in an electrical cutaneous communication system is feasible. (Authors' summary)

1079. HINCHCLIFFE, R., Threshold of hearing for random noise. *J. speech hearing Res.*, 4, 1961, 3-9.

The thresholds of hearing for random noise and for pure tones were measured on a random sample of a representative rural population. After the exclusion of clinically abnormal ears, analysis of the data showed that (a) there is a high correlation between the threshold of hearing for random noise and that for pure tones of 1000 cps and of the two adjacent octaves; (b) the test-retest reliability is high ($r = 0.89$); (c) on the second measurement of the random-noise threshold, there is an improvement of about 2 db; (d) as is also the case for pure tones, there is a deterioration of the random-noise threshold with age according to the expression: $\log(\phi - \phi_0) = ix + z$; where, in the case of the threshold for random noise, ϕ dyn/cm² = the physical intensity of the median threshold stimulus at x years of age; $\phi_0 = 0.004132$ dyn/cm²; $i = 0.032$, and $z = -4.15$. (Author's summary)

1080. LINDAHL, L. E. H., Response adaptation in different sensory modalities as related to individual differences in learning and conditioning. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960, Section VIII, 28.

Many personality and learning theories are in part based upon constitutional individual differences in the presumed properties of the central and autonomic nervous systems. It should follow, then, that these postulated properties of the nervous system would result in general patterns of responses such as manifest themselves in adaptation, learning and conditioning. If the Eysenckian theory, which causally relates the personality dimension of Introversion-Extroversion (I-E) to the underlying hypothesized molar CNS processes of excitation-inhibition, is correct, then it might be expected that these patterns of responses are also related to I-E. Likewise, it might be argued that individual differences in neuroticism (N), which has been conceived of in terms of autonomic imbalance, would also be related to individual differences in these patterns. It would follow that these patterns are perfect measures neither of I-E nor of N but are related to both these dimensions (just as "anxiety" has been shown to have loadings on both these dimensions). It would then be reasonable to suppose that a battery of tests designed to measure these responses would have a high degree of concordance in relating an individual to these two orthogonal dimensions. The following objective tests comprised the battery: PGR adaptation to tone; PGR adaptation to an air puff; blink adaptation to tone; a simple learning task; classical eyelid conditioning. A personality inventory was used to measure I-E and N. It was hypothesized that (a) extraverts should show greater adaptation to introverts; (b) the intercorrelation between adaptation to the different sensory stimuli should be significant; (c) extraverts should learn slower than introverts; (d) extraverts should condition less and at a slower rate but should extinguish faster than introverts; (e) there should be a significant degree of concordance between all tests. Data obtained from normal volunteer males yielded the following results: (a) adaptation was not in the expected direction but there was a highly significant relationship between all modalities, thus supporting the notion of a general pattern of adaptability. (b) The simple learning task yielded significant correlations and in the expected direction. (d) The eyelid conditioning results were not as

expected; a finding of which affected the degree of concordance between tests. The differential reactions to tone and puff are discussed in terms of threatening and non-threatening stimuli. In general it can be concluded, within sampling limitations, that patterns of response do appear to exist and that these seem to be related both to I-E and N. But, the nature and meaning of the stimuli must always be considered. (*Author's summary*)

1081. MARTEL, H. C., and MATH-
EWS, M. V., Further results on the detectability of known signals in Gaussian noise. *Bell Syst. Tech. J.*, 40, 1961, 423-451.

The detection of a completely known signal which may or may not be present in a finite sample of Gaussian noise is considered from two points of view. The first examines the performance of a maximum likelihood detector operating on a finite set of discrete measurements of the stimulus as the set becomes large. The stimulus is either signal plus noise or noise alone. Examples are presented for signals in band-limited noise, using as measurements either equispaced amplitude samples or derivatives at one instant in time. For both, the detectability grows without bound as the number of measurements is increased. The second point of view bases detection on a continuous measurement (linear integral operator) which maximizes the detectability. Solutions have been obtained when the noise has a rational power spectral density. The detector utilizes a cross-correlation between stimulus and signal which is well known and a mechanism, designated extrapolation detection, which involves evaluation of derivatives of the stimulus. The contribution of the derivative measurements to the detectability is examined as the noise approaches bandlimited noise and is found in many cases to grow without bound. (*Authors' summary*)

1082. MICHAELS, R. M., Intensity discrimination for narrow bandwidths of noise at various pulse lengths. *J. aud. Res.*, 1, 1961, 88-110.

Upon the assumption that the auditory system operates in a manner analogous to an envelope detector, a series of hypotheses are stated predicting how intensity discrimination would be influenced by the

variations in the stimulus envelope. Filtered random noise of four different bandwidths and four pulse durations was used to vary rate and number of envelope fluctuations. Seven listeners were used and they heard two pulses of noise in succession, judging the intensity of the second relative to the first. The physical differences between the stimuli were determined by taking the ratio of the total energy contained in each pulse. A transition curve for the responses to the various stimulus differences was plotted and the difference limen taken as the probable error of the fitted curve. The results indicated that discrimination was the same for stimuli whose envelopes were smoothed by the auditory system despite differences in frequency spectrum. For stimuli whose envelope fluctuations occurred at a rate less than the integrating time of the auditory system, discrimination was degraded, increasingly so as bandwidth was reduced. However, the differences among bandwidths were eliminated when pulse duration was reduced sufficiently to preclude envelope variations. This research generally validates the use of an envelope detector model. The auditory system does appear to operate in a manner consistent with such a model. The results suggest that the auditory system operates as if it were a circuit containing a normal resonant filter having a bandwidth of 50-100 cps. This is followed by a nonlinear element and in turn by a low-pass filter of 6-10 cps bandwidths. The output of the low-pass filter operates a statistical decision process. This detects differences between the characteristics of the distributions generated by the stimulus acting within the auditory system. Applying the results of this research to the data on frequency discrimination does, indeed, lead to the conclusion that frequency discrimination is dependent upon intensity discrimination. . . . (*Author's summary*)

1083. PORTER, C. R., Loudness judgment distributions for pure tones. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XXIII, 12.

The purpose of the study was to investigate group and individual distributions of loudness judgments for monotic and diotic reception of 1,000 cycle pure tones. The tone stimuli were eight different sound

pressure levels supraliminally spaced between 25 and 119 decibels. Nine subjects each in a single session compared 216 randomly arranged stimulus pairs. These pairs exhausted all possible combinations of the following factors: (a) eight stimulus I sound pressure levels, (b) the same eight sound pressure levels in stimulus II, and (c) three presentation modes (both stimuli to ear A, both stimuli to both ears, stimulus I to ear A and stimulus II to ear B). The tones were generated by a sine-wave oscillator whose output was amplified, attenuated and introduced through a switching device to one or two extend-range dynamic earphones worn by the subject. After each stimulus pair the subject stated the percentage that the smaller loudness was of the larger loudness. For each sound pressure level in each mode of reception (monaural, binaural or interaural), loudness judgment distributions for individuals and for the group (mean individual) were deduced by mathematically transforming the empirical judgments to those presumed to obtain had a common standard sound pressure level and common presentation mode been used for all judgments. To these adjusted data distribution curves were graduated and the chi-square test utilized to ascertain the goodness of fit. The distribution functions were mathematically transformed into moment-generating functions from which means and variances were calculated. The family of distribution curves, each corresponding to fixed stimulus values, provide a more complete description of the psychophysical relationships between loudness and its acoustical determinants than does Stevens' power function. This present research extends the statistical investigations on supraliminal loudness judgments by Garner and by Stevens and Poulton. Garner obtained supraliminal loudness distributions in the monotic group case. The present data represent the first supraliminal loudness distributions in the diotic group case and in the individual case, both monotic and diotic. The theoretical significance of the distributions arises chiefly from the possibility of later determining and comparing distributions of physiological variables. Loudness is believed to be related to the integral of vibration amplitude with respect to basilar membrane distance, also with the summation of spike potential-

frequency products in VIII nerve fibers transmitting to the brain. Variations in loudness should be traceable to fluctuations in the physiological correlates, and ultimately to variations in biochemical and biophysical events in molecules of the neuronal membrane and elsewhere. (*Author's summary*)

1084. SMALL, A. M., and CAMPBELL, R. A., Differential sensitivity for temporal intervals with auditory stimulation. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XIV, 4.

Procedure. In this study listeners were asked to judge whether the second number of a stimulus pair was longer or shorter than the first. The method of constant stimulus differences was employed; that is, the first (standard) stimulus of a stimulus pair was maintained constant for a given condition and the duration of the second (variable) was varied from one pair to the next in random fashion. Variables manipulated included; the duration of the standard stimulus, the duration of the interval between cessation of the constant stimulus and the onset of the variable stimulus, and the frequency composition of the stimuli. Stimuli were generated and timed electronically, recorded on magnetic tape, reproduced and presented binaurally to groups of listeners by means of dynamic earphones. **Results.** The following results were obtained from 47 listeners each of whom contributed 4,000 judgments for each of the 48 experimental conditions. As the duration of the standard stimulus was decreased the relative differential threshold, $\Delta T/T$, increased. From 400 to 40 ms the increase was small, but as duration decreased from 40 to 0.4 ms, $\Delta T/T$ rose rapidly. This duration effect was a general one that, except for the 250 cps stimulus, held regardless of other experimental parameters. The 250 cps stimulus showed no increase in $\Delta T/T$ as duration shortened from 4.0 to 0.4 ms. Indeed, $\Delta T/T$ changed most markedly as a function of duration for the 5,000 cps stimulus, least markedly for 250 cps, with the noise stimulus being intermediate in this respect. As the interstimulus interval was lengthened from 50 to 3,200 ms, $\Delta T/T$ decreased, subject to two qualifications. First, for the shorter durations

especially there was a tendency for minimum $\Delta T/T$ to occur at 800 rather than 3,200 ms. Second, inter-stimulus interval became less important as a variable as duration lengthened. The effect of inter-stimulus interval on $\Delta T/T$ was independent of the frequency composition of the stimuli. Listeners generally overestimated the duration of the standard stimulus; that is, the point of subjective equality (PSE) tended to be larger than the actual duration of the standard. As the inter-stimulus interval was lengthened the PSE became smaller although rarely becoming smaller than the standard. The influence of inter-stimulus interval was less marked as duration lengthened; at the two longest durations the PSE was independent of inter-stimulus interval. In addition, the PSE was independent of the frequency composition of the stimulus. **Conclusions.** The present results are compared to those of previous investigators; those who studied temporal sensitivity and time error in hearing as well as those who studied other sensory modalities. Some of the present data are related to the nature of acoustic signals of short duration. It cannot be determined conclusively from this study whether the listeners were basing their judgments on duration per se, loudness, or some combination of the two. However, if the judgment were actually being made on the basis of loudness, then the loudness of short stimuli must, indeed, be determined by processes more complex than those previously proposed. (*Authors' summary*)

1085. THURNER, F. K., Comparison of short-time after-effects in different sense-modalities. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XXIII, 18.

50 subjects underwent a series of five experiments. After a week the whole series was repeated on 13 subjects. One experiment concerned after-effects (AEs) in vision (AE of fixating a curved line), one AEs in audition (adaptation to the intensity of a noise), three experiments were within the field of kinesthesia. Duration of stimuli: two minutes for the audition experiment, three minutes for each of the others. Most results hold true for all five experiments. **Pre-stimulation period:** (a) There are highly significant inter-individual differ-

ences between the starting levels (Helson's residual levels). These differences are somewhat stable over the period of a week. (b) There are significant and systematic differences between measurements done in a-order (e.g. line curved to the right) and those done in b-order (line curved to the left), if the subjectively neutral quality (e.g., verticality) is measured. They were interpreted as AEs of the starting-positions. *Period after experimental stimulation:* (a) We found that after stimulation the magnitude of the AE declines according to a log-function of time. Therefore a curve-fitting had to be done with the measurements of each subject on each experiment. By this method we arrived at measures for the degree of the AE and for the rate of its decline, which are comparable inter-individually. (b) The rate of the decline of the AE depends on the size of the AE. (c) In four experiments we got negative AEs. In one kinesthetic experiment (with the direction "straight-ahead" as experimental variable) we got two groups of subjects: one with negative and one with positive (!) AEs. (d) There seem to be certain "tolerance-limits" of the organism: below a certain intensity of stimulus no AE is elicited and a certain magnitude of AE has to be surmounted before a reduction-process is elicited. (e) There might be a possibility of arriving at general laws—which cut across the borders of different senses—if we transform the intensity of the stimuli and the degrees of the AEs into units of "sensitivity". By this method we found that the size of the AE is a log-function of the stimulus-size. *Results with reference to differential psychology:* (a) Only in one of our five experiments the magnitude of the AEs was significantly stable over the period of a week. It was the same experiment in which we found a group with positive AEs and another with negative AEs. (b) The hypothesis (e.g. Eysenck's) that there exists a general factor in AEs—according to which the sizes of the AE and the rate with which the AE is reduced in different senses should correlate with each other—finds no support in our experimental results. (*Author's summary*)

HEARING DISORDERS

AUDIOMETRY

1086. AZZI, A., and LAZZARONI, A., *La sensibilità dell' orecchio alla distorsione di fase.* (Ear sensitivity to phase distortion.) *Riv. Audiol. prat.*, 10, 1960, 109-112.

The authors describe the results of speech audiometry performed with phonetical materials "sensitized" with phase distortion. The tests have been performed on subjects whose hearing was impaired by many types of deafness. In no case [did] the phase distortion cause an appreciable increase of the perception difficulties. (*Authors' summary*)

1087. BARNET, E. G., *New audiometer-hearing aid: the sound pressure equalizer.* *Trans. Amer. Acad. Ophthalmol. Otolaryngol.*, 65, 1961, 126-127.

An audiometer and a hearing aid have been combined in an instrument called the "sound pressure equalizer." The instrument is so constructed that the pressure on both tympanic membranes can be equalized. The electrical input and the hearing loss can be measured on meters either separately or simultaneously. "Normal spoken voice" is used as the test stimulus. The volume controls of the unit are adjusted until the patient responds. The author claims that the instrument can be used to obtain the following information. *Used as an audiometer:* (a) voice reception can be classified as good, mild loss, or lipreading, or both; (b) preference for a monaural or a binaural hearing aid can be determined; (c) prediction of favorable or poor result before stapes surgery can be made; (d) demonstration of hearing in so-called dead or deaf ears; (e) electrical input and decibel loss can be measured on either or both ears simultaneously on separate meters. *Used as a hearing aid:* (a) the physician can talk to the deafest patient without raising his voice, temper or blood pressure, and (b) extremely deaf patients who will not or cannot tolerate regular hearing aids can use this instrument as a desk-type hearing aid for either business, social or family conversation. (*M.H.M.*)

1088. BOWLING, L. S., and ELPERN, B. S., *Relative intelligibility of items on*

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CID Auditory Test W-1. *J. aud. Res.*, 1, 1961, 152-157.

The 36 spondaic items of CID Auditory Test W-1 were administered to 24 untrained normal-hearing subjects for the purpose of estimating the range of intelligibility characterizing this test. The range computed from data produced by these subjects was found to be 10 db, which is considered to be unduly wide and detrimental to the precision of the test. Present results have led to the conclusion that the precision of auditory speech threshold measurements may be enhanced through the use of an indicated group of 22 words exhibiting a range of only 3.5 db. (*Authors' summary*)

1089. CHASE, R. A., SUTTON, S., FOWLER, E. P., Jr., FAY, T. H., Jr., and RUHM, H. B., Low sensation level delayed clicks and keytapping. *J. speech hearing Res.*, 4, 1961, 73-77.

A technique is suggested which may be useful along with present clinical methods of evaluating threshold of hearing. It consists of observing changes in the temporal characteristics of simple keytapping performance when a delay is introduced in the hearing of the click which accompanies each tap. Twenty [normal hearing] subjects tapped on a key in a simple temporal pattern under synchronous and delayed feedback of the click. The feedback was below hearing threshold in the first condition of the experiment, and at 10 db sensation level in the second condition. Differences between tapping performance under synchronous and delayed feedback in the subthreshold condition were not significant, but at the 10 db sensation level they were highly significant ($p < .001$). Intra-individual analysis of the above threshold data yielded significant differences ($p < .05$) between the synchronous and delayed condition for 15 of the 20 individuals. A number of suggestions are made for adapting this technique to clinical use. (*Authors' summary*)

1090. DISSEVELT, A. G., *Audiologisch onderzoek bij kleuters.* (Audiological examination of preschool children.) *Maandschrift voor Kindergeneeskunde*, 28, 1960, 149-161.

An experimental audiological survey was carried out among 313 preschool children from 4½ to 6½ years of age. Continuous audiometry proved to be an effective method of discovering hearing loss among these young children. It is possible to examine about 30 preschool children daily. Only 3% of the children failed the second screening. Hearing losses discovered in the screening were confirmed by the threshold test. 10% of the children were found to have impaired hearing of one or both ears. Among these half had a loss of 30 db or more; no less than 9% of the total number of tested children are auditively handicapped (= hearing loss of 25 db in one or both ears for 3 frequencies in the speech range separated by at least one octave, or a hearing loss for one frequency in one ear of at least 40 db). In most cases of hearing impairment the probable cause was found. The loss of hearing acuity was for the greater part of the conductive type, a small number was of the perceptive type. Early detection of hearing loss is ascertained by audiological examination of preschool children. Starting at preschool age (or earlier) audiological examination should be performed periodically. (*Author's summary*)

1091. DISSEVELT, A. G., DE WIJN, J. F., and DE HAAS, J. H., *Audiologisch onderzoek bij adolescenten op scholen.* (Audiometric testing of adolescents in schools.) *Nederlands Tijdschrift voor Geneeskunde*, 104, 1960, 869-874.

In the course of a general medico-biological survey, the hearing of (about) 1700 adolescents was tested by individual continuous audiometry, using a Peelk audiometer type D₂, as described by Van Dishoeck. In the 250-8,000 cps range or a part thereof, 8-16% of the adolescents had a hearing loss of 20 db or more in one or both ears. Hearing impairment in the speech range was present in 6-13%, of whom one-third were, by the standards used, acoustically handicapped. The principal causes of hearing loss (ca. 50%) were diseases of the eustachian tube and/or middle ear. About a quarter of the hearing disorders has probably been caused by noise. Among more than one million Dutch adolescents aged 12-17, about 100,000 will probably have a hearing loss of 20 db or more in one or

both ears, and at least 30,000 will be acoustically handicapped. Periodic audiometric testing of adolescents is essential, and should be preceded by systematic audiometric examination at school and pre-school age. Otologic examination is necessary whenever hearing impairment is suspected. (*Authors' summary*)

1092. ELPERN, B. S., Differences in difficulty among the CID W-22 auditory tests. *Laryngoscope*, 70, 1960, 1560-1565.

Approximately 1,500 monaural discrimination scores determined from the CID W-22 Auditory Test records were pooled from six different VA clinics. The scores were obtained only from those patients without any suspicion of nonorganic hearing loss. Each of the four lists of the W-22 series were compared with the others with respect to level and range of difficulty. Lists 2 and 3, and lists 3 and 4 did not differ from each other in either respect, and therefore can be used interchangeably in experimental studies. The differences that do exist between list 1 and the others, and between list 2 and 4 are not sufficiently great to introduce serious errors when they are used interchangeably in clinical audiometry. (*R.G.*)

1093. ELPERN, B. S., The relative stability of half-list and full-list discrimination tests. *Laryngoscope*, 71, 1961, 30-36.

Speech discrimination as measured with the CID W-22 recorded lists was analyzed from the reports on 581 patients tested in six different VA clinics. The conclusion reached was that either the first or second half of any test in the series could be used instead of the full 50-word test "with the assurance that the resultant discrimination score will . . . differ only minimally from that which would have been obtained using the full test." (*R.G.*)

1094. FERRER, O., Speech audiometry: a discrimination test for Spanish language. *Laryngoscope*, 70, 1960, 1541-1551.

Nonsense-syllables were used in the construction of a test of speech discrimination for Spanish-speaking patients. Four lists of approximately equal difficulty were developed, each representative of the phonetic distribution in the Spanish language. The lists were tested in the United States on 11

Spanish-speaking subjects from seven Latin-American countries. The articulation functions derived from these normal-hearing subjects are not as steep as those derived from the only other commonly used Spanish test (Tato). Tables give the detailed findings on each subject for each list, and the lists of nonsense-syllables used. (*R.G.*)

1095. HART, C. W., and NAUNTON, R. F., Frontal bone conduction tests in clinical audiometry. *Laryngoscope*, 71, 1961, 24-29.

The test-retest reliabilities of bone conduction threshold tests carried out with the bone conduction receiver applied to the frontal and mastoid bones were determined on four normal ears. Comparison of the results obtained indicates the tests made at the frontal bone are more reliable than those made at the mastoid, an observation supporting the claim that clinical bone conduction tests should be carried out at the frontal bone and not at the mastoid process. (*Authors' summary*)

1096. HEDGECOCK, L. D., Clinical calibration of bone-conduction measurements. *A.M.A. Arch. Otolaryngol.*, 73, 1961, 186-195.

The author reviews the difficulties inherent in bone conduction (BC) audiometry and the sources of error. He discusses the clinical calibration of BC units and gives illustrations of each method: (a) BC matched to air conduction (AC) on 10 or more ears with moderate sensorineural losses; (b) BC matched to AC at 40 db above threshold on 10 or more Ss with normal hearing; (c) BC determined on 10 or more Ss with normal hearing in a well-insulated test room. The accuracy of the latter method for frequencies below 1000 cps is dependent on the amount and type of ambient noise. For 1000-4000 cps, inclusive, the calibration will be similar to those established by the first two methods but is apt to be in error at 250 and 500 cps. If one wishes to test the 250 and 500 cps BC of an individual with normal low-tone hearing, the suggestion is made to occlude the ear under test and place the oscillator on the mastoid of the opposite side. The Rainville Test for measuring cochlear reserve is described as well as the modification by Jerger, Tillman, and Harrison. The

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author feels that it is unlikely that the Rainville Test will replace present methods of BC testing but believes that it will become an important tool after we have had more experience in using it. (J.J.)

1097. **LIGHTFOOT, C.,** The M-R test of bone-conduction hearing. *Laryngoscope*, 70, 1960, 1552-1559.

In this modification of Rainville's (M-R) bone-conduction test, pulsed pure tones delivered from an earphone held against the ear are masked by white noise or narrow-band noise delivered by a bone-conduction vibrator held against the center of the forehead. The difference between the noise level required to mask a tone in a particular patient, and that required to mask the same tone in normal-hearing subjects is the patient's bone-conduction threshold. The principal virtues of the M-R test are (a) that the pure tone cannot be lateralized to the non-test ear, and (b) the simplicity of the equipment, calibration, and test-procedures. (R.G.)

1098. **MANFREDI, A., and CERESIA, G.,** The psychovoltaic reflex and its applications to objective audiometry. *Transl. Bell-tone Inst. hearing Res.*, 15, 1961, 3-17.

The authors discuss the applications of the psychovoltaic reflex—observed in 1952 by Manfredi and introduced into clinical practice in 1955—to objective audiometric tests. The apparatus needed is very simple because of the elimination of the entrance bridge and the complex amplifiers with the resulting abolishment of the maneuvers needed for balancing the entrance bridge and the disturbances arising from the electronic amplification and from the connection to the electrical distribution network. First of all, the authors examined patients on whom the subjective test could be performed and they observed a remarkable agreement between the objective and the subjective findings. Then they examined 28 children whose mental age ranged between two and 10 years. The test was possible in all of them during the first or second sitting, without drug treatment. This result, which has no comparison in the statistics on the detection of the psychogalvanic reflex, is for the most part due to the possibility of knowing in advance, by measuring the base current, whether the patient is in

proper condition for a good conduction of the test. Lastly they studied for medicolegal purposes five patients suspected of simulating. It was possible to determine in all the true status and the result was confirmed through various methods, in particular through the use of phonopsychovoltaic test. All the tests performed confirmed the favorable characteristics of recording the psychovoltaic reflex, which permits of a rapid, sure and easy examination. (*Authors' summary*)

1099. **MOSS, J. W., MOSS, M., and TIZARD, J.,** Electrodermal response audiometry with mentally defective children. *J. speech hearing Res.*, 4, 1961, 41-47.

This study evaluates conditioned electrodermal response audiometry (EDR) techniques with 24 mentally deficient children. Two types of unconditioned stimulus (US) were used on each S; mild electric shock and a bright light. The EDR records were judged to be "good, fair or poor" by two raters, depending on amount of spontaneous activity and ability to score the record. Thirteen of the 48 records were rated as "good" or "fair." The authors conclude that EDR audiometry has limited clinical value for testing mentally defective children and that, in fact, the EDR technique is probably of no greater use with this population than is standard audiometry. (H.B.R.)

1100. **QUIROS, J. B. de,** Interpretacion de los resultados obtenidos con logoaudiometria modificada. Sobre 140 casos de diversa patologia. (Interpretation of the results obtained with modified speech audiometry. Covering 140 cases of diverse pathology.) *Fono Audiol.*, 6, 1960, 176-189.

Modified speech audiometry consists in making a common speech audiometry curve and then repeating the outline but passing the same list of words in groups of three, and increasing progressively the intensity of the audiometer [10 db increments]. In these conditions six types of curve combinations may be obtained. In Type I there is a coincidence between the common curve and the modified curve, both attaining 100% discrimination. This shape is considered normal. The displacement of up to 10 db of the modified curve is also, considered normal. In conductive deafness,

Type I curves are obtained (with total displacement of both curves). The shape also adopts normal characters in the medullar and cerebellar lesions, in central vestibular lesions and in compensated cephalic lesions (tumors or degenerative processes of slow development). In the majority of stuttering cases this shape is observed. In Type II there is a coincidence between the common curve and the modified one, but they do not reach 100% discrimination, taking a plateau or bell shape. This type of curve is found in receptive deafness, although it does not appear to be exclusive to the end-organ lesion. In Type III the common curve must be interpreted as the result of a global disorder of the cortex (organic or functional). When this global disorder represents only an inhibitory state of emotional nature, the fall is very slight and adopts the appearance of a plateau. 100% discrimination is occasionally reached. In the chronic vascular conditions, the bilateral fall is more intense. In oligophrenia it is very great and takes the "mountain chain" appearance. The unilateral modified falls, when they are important, betray generally a destructive lesion or a disorder at the contralateral temporal lobe level. In some stuttering cases Type III curves may be found unilaterally or bilaterally. The temporal irritative lesions do not seem to give significant disturbances in the test. In Type IV the curve is normal and the modified curve reaches 100% discrimination but deviates more than 10 db unilaterally or bilaterally. This type of curve was found in diffuse disturbances of arterial type which did not seem to affect the cortex, and also in stutterers. We consider it an intermediate type between I and III. In Type V the common curves take the form of a bell or plateau without reaching 100% discrimination, and the modified curve falls more than the former. This type of shape may indicate a receptive disturbance concomitantly with another diffuse central one (if it is bilateral) or a contralateral temporal one (if it is unilateral). It is also found in pure severe aphasic or cortical lesions, without direct receptive disturbance. In Type VI the curve begins as Type III but with an increase of intensity reaches 100% discrimination, then falls again as intensity increases. Different factors may

influence its production, but among them it is important to point out the great variability of attention. (M.S.W.)

1101. REED, G. F., *Audiometric response consistency, auditory fatigue and personality. Percept. Motor Skills*, 12, 1961, 126.

30 school children aged 11 to 15 were administered a routine binaural pure-tone audiometric test and then a further 20-minute test limited to high frequency tones. Half of the group had been psychiatrically diagnosed as predominantly hysteric, the other 15 as anxious. In accordance with the initial hypothesis, the hysterics were less consistent, the majority exhibiting a rise in threshold on second testing. (A.R.)

1102. WELSH, L. W., and WELSH, J. J., *Clinical problems in masking. A.M.A. Arch. Otolaryngol.*, 73, 1961, 112-119.

"Current and future advancements in otology require an advanced level of audiologic knowledge, one phase of which is the proper application of masking." Masking is indicated when there is (a) an air conduction loss with a large Air-Air gap of from 40 to 50 db or more between the ears; an air gap of greater than 40 db requires masking; 30-40 db suggests its use; under 30 db it is unnecessary; (b) a bone conduction loss with a large A-A gap; (c) symmetrical hearing loss by air with uncertain bone levels. In the latter case the bone conduction levels are more certain in the ear to which the Weber has lateralized. The authors suggest the following principles: (a) *depression*—using sufficient masking in the contralateral ear to eliminate the shadow curve; (b) *stabilization*—increasing the masking until a hearing level is reached which will not be depressed further by additional masking; (c) *lateralization*—when the tone has shifted from the better bone conduction level to the ear under test, one can assume that the masking was adequate. Eight audiograms and case histories are presented in illustration of the principles cited above. (I.J.)

AUDITORY TRAINING

1103. MASYUNIN, A. M., *Ispol'zovanie ostatkov slukha glukhonemykh shkol'nikov pri ustraneni defektov proiznosheniya frazy.*

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(Utilizing the residual hearing of deaf school children to help eliminate defects in the pronunciation of sentences.) *Spetsial'naya Shkola*, 97, 1960, 28-35.

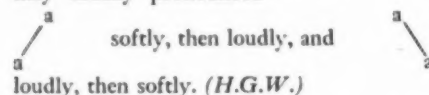
The most important problem is to teach oral speech, which in deaf children suffers from the following defects in the pronunciation of sentences: defects in dividing-up the sentence by pauses; absence of sentence and logical stress; and absence of elementary intonation. Residual hearing can with sound-amplifying apparatus supplement lipreading and above all help towards distinctness of pronunciation by ear. This article explains what possibilities deaf children have of eliminating pronunciation defects by ear. Previous experiments having shown they could reproduce by ear a number of syllables and the duration of pronunciation of a word. Their ability to grasp pauses in a sentence which separate syntagmas from each other was tested. Fifteen pupils were selected from Class III and upward, of whom five belonged to Group IV, five to Group III and five to Group II. (See Neiman's classification *Izvestia Academy of Pedagogical Sciences RSFSR*, 1954, No. 62.) 10 simple Russian sentences were used in the preliminary investigation. The majority, when pronouncing these sentences, separated them only by words, and the pauses did not correspond to the sense. Then a table with each sentence was put before the pupils with the written sign indicating a pause not marked, and they were asked to pronounce the sentences, which they usually did by pausing after each word. The teacher then said, "Listen to how you speak," and covered his face with a screen and imitated their pronunciation exaggeratedly. He then said, "Listen how to speak correctly," and covering his face again gave the correct pronunciation of each sentence. After frequent exercises of this kind the pupils were asked to distinguish by hearing the correct way of dividing-up the sentence from the wrong one and then to reproduce it. The sentences were right under their eyes the whole time, which gave them a chance to follow the teacher's pronunciation and mentally or even with finger spelling to note the pauses. Results showed that even a slight degree of residual hearing can be used to eliminate defects

in dividing-up sentences by pauses; even pupils from Group II after two or three lessons correctly reproduced by imitation all the sentences in their own pronunciation. Before work on the 10 sentences started, the pupils had been asked to read a very short story of five sentences, and on their re-reading it after this work, the character of their reading had noticeably changed. Although pauses did not always correspond to sense, the number of mistakes in dividing-up the sentences were nearly three times fewer. *Elimination of defects in logical emphasis*: Words on which logical stress falls, are generally pronounced louder and mastery of this helps to a better understanding of speech, both spoken and read. The same pupils were asked to read 10 new sentences (e.g., "Children gathered mushrooms.") and were then asked questions like: "Who gathered mushrooms?" "What did the children do?" and "What did the children gather?" The preliminary investigation showed that logical stress was completely absent, but after prolonged work on all the sentences, all defects of logical stress were completely eliminated, even with Group II pupils. *Comprehension and reproduction of Sentence Intonation*: The preliminary enquiry showed intonation was lacking in all the same pupils without exception. Ten sentences were chosen so that each could be pronounced without changing the word form and structure with both a narrative intonation (Boy broke stick.) and an interrogative one (Boy broke stick?) Two tables on which were written both variants of each sentence were placed before the pupil, who was asked to grasp the difference in sound. The teacher, covering his face with a screen, pronounced the two sentences in varying order. The pupil, with the aid of earphones, was asked to listen and point to the corresponding sentence on the table. He was immediately informed which answers were right and which wrong. Results showed Group II pupils, who could comparatively early perceive an alteration in voice intensity, were unable to distinguish by ear a modulation in voice, i.e., narrative intonation from interrogative. Pupils from Group III, and especially Group IV, began after two or three lessons to distinguish sentence intonation by ear fairly accurately.

When trying to reproduce the intonation by imitation, they usually used logical stress, marking different words in the sentences with a louder pronunciation. When it was explained to them that it was impossible to grasp intonation by visual or touch-vibratory means, they said they caught the difference in sound, but could not reproduce it. To simplify this problem, vowel "a" was written on tables with a notation to indicate the raising or lowering of the voice:



and the pupils were shown in which case the sound would be pronounced in a high or low voice. The teacher then, without a screen, pronounced "a" in front of the microphone, accompanying the raising or lowering of the voice by movements of arm up or down. When the pupils were asked to distinguish these sounds by ear, results showed that Group III and IV were able to catch by ear the variations in pitch, but reproduction in their own pronunciation proved to be beyond them (although all had 10 lessons each on this), as instead of raising or lowering the voice, they usually pronounced



1104. NUDEL'MAN, M. M., O razlichii glukhonemymi det'mi nerechevykh zvykov. (On distinguishing non-speech sounds by deaf children.) *Spetsial'naya Shkola*, 97, 1960, 35-40.

Half of deaf people can hear loud sounds, while about 30% can distinguish speech sounds. The results of a six-week inquiry is shown into peculiarities in the distinguishing of non-speech sounds within a group of 20 children with approximately the same degree of residual hearing. They had already learned to distinguish the sounds of a drum, tambourine, pipe and school bell after numerous exercises in the hearing cabinet. To test the consistency of their ability to distinguish these four sounds, the series was increased to eight and the sequence was altered. This resulted in 18% incorrect answers, tambourine being mistaken for drum and bell for tambourine,

but never drum for bell or pipe. An experiment with children from six to seven years with normal hearing to ascertain their ability to distinguish sounds was as follows: Each child had to name the object making the sound from a series of hidden objects, previously shown to and heard by them (tick of metronome, stropping of razor, crack of mechanical frog being wound up, click of trunk being unlocked, and squeak of electric light bulb being turned in its socket.) Changing the sequence did not affect their ability to distinguish the sounds, and when a new sound of cutting glass was substituted for the squeaking of the bulb, only one child failed to recognize a fresh sound, but quickly realized his mistake. Thus, all the children could distinguish a series of sounds after hearing them twice. Changing the sequence and introducing a new sound had no effect on their ability and they obviously had a clear image of all the sounds, as their readiness to imitate them showed. But with deaf children the ability to distinguish was clearly upset when a new sound was introduced. Another experiment was with 10 pupils from Class III to V of a school for the deaf, already able to distinguish fairly well sounds of drum, tambourine, pipe and bell, who listened on the teacher's microphone and were able to distinguish three new sounds, both before and after the old ones: stick striking table, glass struck gently with tea-spoon, and whistle on a child's flute. After a five-minute break the sounds were presented in a mixed order with three new sounds introduced. The pupils were asked to answer in oral and written form what sound they had heard. The three new sounds were either not recognized or confused with the old ones, and the indistinctness of the acoustic image was apparent. *Conclusions from this inquiry:* (a) For deaf children with residual hearing, their conceptions of a sound previously heard have peculiarities which distinguish them from those of children with normal hearing. (b) Their acoustic images, being insufficiently distinct, are easily assimilated to the acoustic properties of another sound close to them in a series of sounds. (c) Instability is a characteristic feature of the acoustic images of these deaf children, as they are very susceptible to disturbance.

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(d) In the formation of acoustic images not merely one single analysis takes part, but a number of analyses, such as vibratory and, particularly with deaf children, visual components. (e) As changing the order of the sounds, extending the series and introducing new sounds, negatively affected the ability to distinguish sounds already mastered, it is obvious that teachers must vary more the conditions of forming this ability. Reliability in retaining them depends on how frequently they are repeated. Above all, they should be included in the child's activities at play or in school. It is possible to perfect the acoustic images of children with residual hearing by prolonged, systematic work. At first only a reaction to the sound is expected from pupils. Then the ability to distinguish sharply contrasting non-speech sounds. Finally, the ability to distinguish relatively similar non-speech sounds must be developed. (H.G.W.)

1105. POULOS, T. H., A short term aural rehabilitation program. *Volta Rev.*, 62, 1960, 345-347.

In the last 10 years, an increasing number of city-wide or state-wide hearing surveys have pointed out the problems of social and educational adjustment of the hard of hearing child in a community that lacks rehabilitation facilities. As a result of these problems, more and more children are referred for rehabilitative measures to local and state agencies. The state schools for the deaf principally serve those children who are classified as deaf; the hard of hearing child who has language and some hearing often is a failure in public school and yet not an acceptable candidate for the schools for the deaf. Each child is given an audiometric and speech-hearing test, otological follow-up, hearing aid evaluations and recommendations. Attendance at a short term aural rehabilitation program for the hard of hearing, followed by return to the public school, is recommended. The program is devised to help the children in speechreading, speech correction, auditory training, and care of hearing aids. On the child's return home, there is a follow-up program. A short description of the instructional materials used is given, and the results of 87 questionnaires concerning the child's progress in the school

is reported. While the original program was planned as an experimental one, the service is now in its tenth year and a total of 361 children have been enrolled. (J.B.M.)

DIAGNOSIS AND APPRAISAL

1106. ALTMANN, F., Ménière's disease. *J. Amer. med. Assn.*, 176, 1961, 215-218.

The author reviews the classic symptoms of Ménière's disease. The auditory disturbances are usually characterized by wide fluctuations in hearing in the lower and middle range, the presence of recruitment, diplacusis binauralis dysharmonics, and tinnitus of either a high pitched or low pitched character. Attacks of true vertigo usually occur when the hearing loss and tinnitus have reached their maximum intensity but sometimes also after they have begun to recede. The condition is unilateral in about 80% of the cases and bilateral in about 20%. Pathological studies have shown a considerable dilatation of certain parts of the inner ear (labyrinthine hydrops). The cochlear duct is dilated in all postmortem sections examined, the saccule in most of them, the utricle in many, but the semicircular canals in none. Dilatation of the cochlear duct is the only pathological change observed in some cases which agrees with the clinical findings in cases of "cochlear hydrops" in which attacks of vertigo never develop. The dilatation of the endolymphatic system is the result of an increased endolymphatic pressure. The absence of changes in the perilymphatic spaces leads to the conclusion that the cause for this increase in pressure must be located within the endolymphatic system itself. Temporary blockage of the arterioles or venules in the endolymph-producing areas due to psychosomatic cause has been considered the source of the disturbances in the secretion of the endolymph. Nothing definite is known about the etiology of Ménière's disease. A still unproven theory which has found many followers sees the cause of the condition as an imbalance of the autonomic nervous system (ANS) which leads to spasms in the arterioles supplying the places where endolymph is produced. The arteriolar spasm is followed by dilatation of the capillaries and of the adjoin-

ing venules and an alteration in the permeability of the vascular walls, with a change in the chemical composition of the endolymph. Such a "localized dysfunction of the ANS" has been regarded as the manifestation of a so-called physical allergy. Unfortunately for this theory, there is considerable evidence that the small blood vessels of the labyrinth are not under ANS control. An ordinary antigen-antibody type of allergy, endocrine dysfunction and a hypometabolic syndrome with deficient utilization of thyroid hormone in the cells of the endolymph producing areas are among the other causes which investigators have suggested for this condition. Ménière's disease is too often diagnosed by physicians and must be differentiated from a number of conditions which are described by the author. The basis for the differential diagnosis between Ménière's disease and these conditions is summarized. Finally, Altmann reviews the medical and surgical management of the condition: Medical treatment, directed toward the reduction of the increased intralabyrinthine pressure and the prevention of its recurrence, should be tried first in all cases. Until recently, the only reliable surgical methods of eliminating the vertiginous attacks were either intracranial section of the eighth nerve or opening of the inner ear, with destruction of its contents by an approach either through the mastoid or through the external auditory meatus. Hearing is completely lost in these procedures, while a high-pitched but rarely bothersome tinnitus often persists. Intracranial section of the vestibular portion of the eighth nerve is technically difficult. Destructive labyrinthine procedures are only feasible in unilaterally involved patients having hearing below a serviceable level on the involved side. A promising recent surgical approach involves the use of radiation with ultrasonic waves to destroy selectively the diseased labyrinth. Ultrasound is applied to the bony lateral semicircular canal which has been exposed by opening the mastoid under local anesthesia. The ultrasound is applied with a specially constructed applicator for 30-60 minutes until the direction of the nystagmic eye movements, which are consistently watched during surgery,

indicate that the vestibular function of the radiated ear has been destroyed. The procedure results in the elimination of vertigo with the possible exception of a few attacks in the first weeks after surgery. Hearing remains unchanged and continues to fluctuate or might even get slightly better. The tinnitus often becomes less intense but usually does not disappear entirely. Results with this treatment have been quite satisfactory in 60 patients treated thus far. Vertiginous attacks were completely eliminated in about 80% of the cases. The author expects the treatment of Ménière's disease with ultrasound to replace methods of surgical treatment now in use and will also be used for many patients now receiving medical treatment to which they are not responding satisfactorily. (M.H.M.)

1107. ARIAGNO, R. P., Ultrasonic surgery for Ménière's disease. *Amer. J. Nurs.*, 60, 1960, 1778-1780.

Vertigo, deafness and tinnitus, the classical triad of Ménière's disease, are due to an increase in the quantity of endolymph and resulting increased pressure in the cochlea and labyrinth. While a small percentage of cases can be traced to specific allergens, the majority appear to be of psychosomatic origin. Medical management may eventually dictate a selective destruction of the balance organ with ultrasonic waves which preserves the patient's hearing. The intensification of the disease symptoms which usually follow such surgery will gradually disappear and complete rehabilitation can take place as the patient learns to balance visually. Keeping his gaze a few feet ahead of his body, avoiding darkness or sudden motions and learning new safety precautions are aspects of the patient's altered status following such surgery. (L.E.C.)

1108. BARBERI, G., Il "test all' Hydergina" nei vertiginosi. (The Hydergin test in patients with vertigo.) *Minerva Otorinolaryngol.*, 10, 1960, 255-259.

The pharmacologic and therapeutic properties of Hydergin are described and the technique of the "Hydergin test" is illustrated. This test was performed in 20 patients suffering from vertigo of various types. The responses are analyzed. The

results confirmed a neurovascular and diencephalic origin of the syndrome in a high proportion of cases. The test has both experimental and clinical uses. (*Author's summary*)

1109. BOLOGNI, G., *La crenoterapia della sordità.* (Deafness and crenotherapy.) *Ann. Laringol., Otol., Rinol., Faringol.*, 60(1), 1961, 44-85.

Many cases of deafness can be treated with good results by a simple sulfurous crenotherapy; but the success is also obtained using alkaline salt-sulfate water, associated to hydrogen sulfide. In this case the function of the ciliary epithelium of the Eustachian tube is preserved. Therefore "Tettuccio" (alkaline salt-sulfate water) develops a favorable action, hindering the damaging effect of hydrogen sulfide on the trophism of ciliated epithelium. Another factor is important as to the action mechanism of "Tettuccio" water in the treatment of deafness, that is the possibility of absorption of the water through the tuba mucosa, also favored by the enhanced trophism produced by the contact with the water and the water penetration into endolymph. (*Author's summary*)

1110. BURTON, R. D., and WRIGHT, R. W., *Idiopathic hemotympanum—A new approach.* *Laryngoscope*, 71, 1961, 48-53.

A case report is presented of a 20-year-old man who complained of recurrent pain and bloody discharge from one ear. Hearing had not been normal in that ear as far back as the patient could recall. The tympanic membrane was dark blue and retracted but intact. X-ray showed the mastoid to be diffusely sclerotic with a possible radiolucent area in the antral region. The audiogram showed a relatively flat hearing level of about 35 db with normal bone conduction. The middle ear and mastoid were first cleaned out during a simple radical mastoidectomy, and about three months later through paracentesis, but there were no changes in hearing. Ten days after the paracentesis, a polyethylene tube "was inserted into the middle ear through an incision in the tympanic membrane. . . The hearing was immediately normal. . . The hearing has remained normal . . . except on one occasion when the tubing became dislodged." (R.G.)

1111. CERONI, T., and CASTELLINI, G., *Sordità rinogena e crenoterapia sulfurea: risultati immediati.* (Rhinogenic deafness and sulphuric crenotherapy: current results.) *Riv. Audiol. Prat.*, 10, 1960, 7-42.

After reviewing the action of thermal waters the authors discuss the various technical problems of crenotherapy in the treatment of deafness, the aims of this type of therapy, and the methods most usefully employed in its application. The results obtained by the authors at Tabiano Spa in the treatment of deafness of catharral etiology showed an average increase in the transmission type of 8.73 db, and in the mixed type an average increase of 7.66 db. Among the deciding factors influencing the gain is the comparative youth of the sufferer, a hearing loss lower than 30 db at the commencement of therapy and treatment within the first year of the appearance of the disease. The result of the cure, though promising, cannot be considered as definite without a check up of the patients at some more distant date. (*Authors' summary*)

1112. DILL, J. L., *Importance of evaluating hearing in young children.* *Eye Ear Nose Thr. Dig.*, 23, 1961, 11-16.

Otologic and audiologic examination of children five years of age or older is not particularly difficult. The child below age five, however, has been neglected in terms of evaluation, treatment and advice. Such evaluation in young children requires time, patience and careful observation as well as experience. The care of young children with suspected auditory impairment should be the responsibility of the otologist. However, because of the special difficulty involved in evaluating these children it may be preferable to refer them to an audiologic clinic. At such a clinic special techniques such as play audiometry and the skin galvanometer test may be used. The otologist may also use these same methods if he can spend the time and interpret the test results accurately. It is possible that the child being tested may be retarded, have brain damage, or be spastic. It is very difficult to test these children because of failure to obtain responses or the inability of the child to cooperate. A complete hearing evaluation is essential in

planning the rehabilitation of the child. Two case studies are shown, one for a conductive and one for a perceptive loss of hearing. (P.E.R.)

1113. FENU, G., and GABRELLI, L., Il comportamento del test di Carhart nelle ipoacusie da trauma cranico chiuso. (The behavior of Carhart's test in diagnosing cerebral trauma.) *Riv. Audiol. prat.*, 10, 1960, 7-23.

Research carried out on 40 cases of head injuries shows that the behavior of the adaptation as evidenced by Carhart test is not a safe guide for diagnosing the seat of the injury. The frequently probable interference of extra-cochlear factors notably limits the utility of tests of this kind. The test has some value as an addition to the general semeiologic picture. (Authors' summary)

1114. HALLPIKE, C. S., HOOD, J. D., and TRINDER, E., Recent advances in the electro-nystagmographic investigation of neurological disorders of ocular movement. *Proc. roy. Soc. Med.*, 53, 1960, 1059-1063.

The "... nystagmographic analysis of certain derangements of nystagmus and other ocular movements which are present in many of the organic affections of the VIII nerve system ..." introduces certain problems of instrumentation and interpretation of recordings. The authors briefly describe equipment they have designed that provides graphic recordings "... not only of nystagmic and other transient eye movements but also of sustained deviations of gaze." Nystagmograms of three subjects are illustrated. One subject is normal, one exhibits spontaneous nystagmus following unilateral labyrinth destruction for Ménière's disease, and one has spontaneous nystagmus resulting from a tumor of the right cerebello-pontine angle, with early involvement of the vestibular elements within the brain-stem. Differences in the tracings from these three subjects are pointed out. "The possibility of effecting a differentiation of these lesions upon the basis of differences in the characteristics of the nystagmus itself is clearly a matter of considerable practical importance." For full technical details of the design, construction and performance of their equipment, the

authors refer to a previous article in another publication. (J.L.S.)

1115. HOUGH, J. V. D., Partial stapedectomy. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 571-596.

Procedures termed partial stapedectomy have been presented for the restoration of hearing in the otosclerotic ear. An attempt is made in these procedures to: (a) remove the diseased portion of the stapes, and (b) preserve all normal structures in a functional state. The results reported here seem to recommend this segmental removal of the stapes as theoretically sound and functionally effective. Further investigation and clinical trial is encouraged to develop more completely this concept of surgery on the stapes. (Author's summary)

1116. JERGER, J. F., Recruitment and allied phenomena in differential diagnosis. *J. aud. Res.*, 1, 1961, 145-151.

A comparison is made among three audiological procedures with respect to their ability to predict site of lesion in auditorily impaired Ss. Fifty-two Ss with "relatively well-defined sites of lesion" were tested with the alternate binaural loudness balance test (ABLB), the short increment sensitivity index (SISI), and Békésy audiometry, using both continuous and interrupted stimuli. 21 Ss had unilateral conductive loss, 20 were diagnosed as having Ménière's disease and 11 possessed acoustic neuroma. The ABLB proved to be least effective in determining site of lesion, while Békésy audiometry was the best single test in this regard. None of the three tests, individually, provided perfect prediction. However, when used in conjunction with one another, these three procedures indicated site of lesion accurately in all cases. The author stresses the fact that diagnostic audiologic tests should be judged on the basis of their accuracy in determining site of lesion, rather than on their ability to indicate the presence of recruitment. (H.B.R.)

1117. JUERS, A. L., Stapedioplasty. Further observations. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 316-327.

In the series of cases reviewed (31), the best results were obtained in those patients in whom a partial stapedectomy was performed, the air-bone gap being completely

eliminated. The conductive component was removed only by posterior approach. The technique in the cases as well as the author's summary.

1118. The monitory separation of the vocal fold, a voice of the hearing cases.

1119. The stapedioplasty achieved hearing function by the results to 10% in air conduction, the stapedioplasty reported the results of such a summary.

1120. The PCSR Rhinology. This and the incompleteness of the EDR.

eliminated. Though the technique is difficult and tedious, an efficient by-pass conduction mechanism (stapedioplasty) can be reconstructed in many patients by using only autogenous tissues. Routine early postoperative audiometric studies should be carried out to point the way to those techniques and other factors which result in the least high tone cochlear morbidity as well as permanent conduction efficiency. (*Author's summary*)

1118. KODMAN, F., Jr., The lateralization method for evaluating monaural deafness. *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 224-233.

The lateralization method for evaluating monaural hearing impairment includes four separate measures or observations: shadowgram, lateralized speech reception threshold, lateralized discrimination score, and a voice quality report. Criteria for failure of the lateralization method (nonorganic hearing loss) are given, and five illustrative cases are presented. (*R.G.*)

1119. KOS, C. M., Vein plug stapedioplasty for hearing impairment due to otosclerosis. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 559-570.

An analysis of 100 consecutive vein plug stapedioplasty procedures reveals that 90 achieved (air-bone gap closure) maximum hearing improvement permitted by the function of the hearing nerves as measured by pure tone bone conduction. 52 of these resulted in essentially normal hearing (0 to 10 db). Of the 10 which did not result in air-bone gap closure, six produced hearing thresholds of better than 30 db in the speech range. Despite the possible tentative nature of the preliminary results reported here, the superiority of them over the results of previously employed techniques indicates a potential achievement of success heretofore unattainable. (*Author's summary*)

1120. LEHRHOFF, I., A study of PGSR testing of Rh athetoids. *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 234-238.

Thirty children between the ages of 7 and 14 with athetosis attributable to Rh incompatibility were tested by means of electrodermal and behavioral audiometry. EDR could not be elicited from eight chil-

dren. The remaining 22 required more conditioning trials than is necessary for children without brain injury, and latencies of the EDR were longer and more variable. As a group, the children showed bilateral high-frequency hearing losses. Electrodermal audiometry yielded slightly lower thresholds than were determined by behavioral audiometry. (*R.G.*)

1121. MENZEL, O. J., *Audiology. Eye Ear Nose Thr. Mon.*, 40, 1961, 132-134.

One major challenge facing the speciality of otology is that of diagnosis of auditory lesions. The field of "diagnostic audiology" is helping to meet this challenge by a series of new, sensitive, functional tests of the auditory mechanism. A second challenge confronting the otologist has to do with the rehabilitation of the patient with irreversible hearing impairment. The specialist in "rehabilitation audiology" concerns himself with this problem. The audiologist can furnish much information to the otologist concerning the determination of the hearing level and the location of the site of the lesion. The use of special techniques such as PGR make it possible for the audiologist to determine hearing thresholds in very young children. Other types of tests such as auditory sensitivity tests, tests of differential sensitivity, tests of loudness function, tests of temporary threshold shift, tests of auditory discrimination for normal as well as distorted speech, and tests of spatial localization may be of assistance in locating the site of the lesion along the auditory tracts. Many of the techniques discussed have been developed within the past 15 years. Continued cooperation between the otologist and the audiologist will help to solve the knottiest diagnostic problems. (*P.E.R.*)

1122. MONKHOUSE, J. P., Some triumphs and some problems of middle ear surgery. *Proc. roy. Soc. Med.*, 54, 1961, 149-155.

The author, a physician, emphasizes the great strides recently made in chemo- and antibiotic therapy. At the same time, he acknowledges that secretory otitis media remains a difficult medical problem. The fenestration he regards as a proven method for obtaining consistent results and lasting improvement in otosclerotic cases. The

stapes mobilization technique may produce more dramatic results postoperatively, but his experiences with 129 of these operations indicate the improvement does not hold in the majority of cases. He preferred not to evaluate the more recent stapedectomy approach and referred the matter to other medical authorities who, he said, had more experience in this operation. (J.L.S.)

1123. MYERS, D., Role of family physician in the discovery and habilitation of the acoustically handicapped child. *Pa. Med. J.*, 63, 1960, 1779-1781.

When hearing loss goes undetected and untreated until children are of school age, educational growth will be retarded. The author, a member of the Pennsylvania Academy of Ophthalmology and Otolaryngology's Committee on Conservation of Hearing, point out the importance of early discovery of loss, the family physician's responsibility in securing aid for the child through specialized personnel and services, and his role in the child's habilitation, once a differential diagnosis is established. (*Rehab. Lit.*)

1124. REED, G. F., and CHRISTIAN, M. A., A study of the effects of loud sound on tinnitus. *Laryngoscope*, 71, 1961, 167-180.

Fifty patients with tinnitus presumably of cochlear origin were exposed to pure tones in excess of 119 db SPL for 10 minutes in three successive sessions at least one week apart. The frequency of the exposure tone was slightly higher than that of the pure tone to which the tinnitus was matched. The patients were asked to describe any changes in their tinnitus after the exposure. An index of neuroticism for each patient was determined by the MMPI. A similar group of 50 patients (control) underwent the identical procedure except that during the exposure session they sat for 10 minutes in silence. 19 treated patients and 4 control patients reported unequivocally after at least two of the three sessions that the tinnitus had changed. 12 of the treated patients reported a diminution in the tinnitus, and 7 reported an increase. None of the changes in tinnitus were permanent. Only 34 of the 100 patients (17 in each group) showed neuroticism according to the MMPI. This is a smaller proportion of neurotics than has

been reported by others with regard to patients with tinnitus. In the present study reported changes were no more common from the neurotic patients than from the others. (R.G.)

1125. ROSENBLÜT, B., GOLDSTEIN, R., and LANDAU, W. M., Vestibular responses of some deaf and aphasic children. *Ann. Oto. Rhinol. Laryngol.*, 69, 1960, 747-755.

Vestibular responses to caloric stimulation at 18° C were tested in 107 deaf and 57 aphasic children. Duration of nystagmus was measured from the beginning of flow of water into the ear canal. On the basis of the responses of 16 normal children a duration of 120 sec or more was considered normal. Responses were classified as absent, depressed (115 sec duration or less), and normal. . . . As a group the aphasic children showed poorer vestibular responses than did the deaf children. Vestibular responsiveness in the total population was more clearly related to etiology than to any other factors. There was a significant relation between the depression of hearing sensitivity and the depression of vestibular responsiveness, but not enough to be predictive for the individual case. (*Authors' summary*)

1126. SCHUKNECHT, H. F., McGEE, T. M., and COLMAN, B. H., Stapedectomy. *Ann. Oto. Rhinol. Laryngol.*, 69, 1960, 597-609.

The results with stapedectomy are so good that in spite of the incidence of delayed cochlear degeneration, the operation appears superior to other procedures for otosclerosis. At this time we believe there is no functional difference between various implants being used to replace the stapes, so the choice of technique is one of individual preference. A factor of great importance is that of surgical skill. The skilled surgeon, following strict rules of procedure to avoid labyrinthine trauma, will experience fewer complications than the occasional operator. Of 287 stapedectomies in which a tissue-metal implant was used, bone-air gap of 10 db or less was acquired in 74.9%. Delayed cochlear degeneration occurred in 2.4%. On the basis of earlier experiences, we predict that bone reclosure of the oval window will occur

eventually in ears in which there is extensive or active otosclerotic disease. On the other hand, we believe that the operation may be permanently successful for ears with small inactive otosclerotic lesions. (Authors' summary)

1127. TATO, J. M., Stapes surgery. *Laryngoscope*, 70, 1960, 1603-1607.

A flap made from the mucosa of the promontory and oval window niche is substituted for a vein graft in a modification of Shea's technic of stapes surgery for otosclerosis. Audiometric data are presented on the poorest and best results on eight patients operated by this technic. The average improvement in air conduction thresholds for 500, 1,000 and 2,000 cps was 35 db for the poorest case, and 67 db for the best case. (R.G.)

1128. TATO, J. M., SEBASTIAN, G. de, and FERNANDEZ, V., Modificaciones de la audición contralateral en las intervenciones del oído. (Modifications in audition in the contralateral ear following surgical interventions.) *Fono audiol.*, 6, 1960, 202-205.

The authors cite numerous improvements in audition in the contralateral ear following stapes mobilizations, fenestrations, and tympanoplasties, having variable duration—in one case greater than two years. They find that the contralateral gain is produced especially in the low frequencies. The gains are transitory, seldom surviving a year postoperatively. The greatest incidence followed stapes mobilizations, with improvements being somewhat more transitory among the fenestrations, and the least incidence occurred among the tympanoplasties. They point out that there is no proved mechanism explaining this phenomenon, but offer several hypotheses. (M.S.W.)

1129. VERNON, M., The brain injured (neurologically impaired) deaf child: a discussion of the significance of the problem, its symptoms and causes in deaf children. *Amer. Ann. Deaf*, 106, 1961, 239-250.

The academic, emotional and physical symptoms associated with neurological impairment are reviewed. Causes of neurological damage which are related directly to the parents, pregnancy, the birth process, and factors in the medical history are

listed. Psychological tests utilized in the diagnosis of neurological disorders in deaf children are the Wechsler Performance Scales, Draw-a-Man and Human Figure Tests, the diamond from the Stanford-Binet, Marble Board, Ellis Test, Hiskey Blocks, etc. Two diagnostic forms to aid schools for the deaf in identifying brain-injured children are presented. Norms for the rating forms are being developed and will be made available. (C.P.G.)

EDUCATION

1130. ACADEMY OF PEDAGOGICAL SCIENCES, RSFSR, Plan Nauchno-Issledovatel'skogo Instituta Defektologii na 1960 god. (Plan of the Scientific-Research Institute of Defectology for the year 1960.) Moscow: APN, 1960, 80-96.

This plan is a part of the overall seven-year (1959-1965) program of the Academy of Pedagogical Sciences, RSFSR, of which the Moscow Institute of Defectology (ID) is one of the divisions. The Soviet seven-year educational plan revises the programs of all schools and is directed to enable children to meet the heightened demands of contemporary life. The Moscow ID in this program is directed by the Academy of Pedagogical Sciences to pursue scientific and methodological research in teaching handicapped children, to improve training of teachers, therapists and medical doctors employed by special schools. In compliance with the new goals of the seven-year plan, ID is supposed to prepare new textbooks, manuals and primers, to devise new audiovisual material and to design modern equipment for correction of and compensation for the disturbed functions of the handicapped children. In accordance with the requirements of modernized industry, ID will work out measures for the improved future professional activities of these children and for their more active participation in the scientific work of the country. These assignments are to be fulfilled in close connection with special schools for children in cooperation with other educational research centers and with teachers' institutes, departments of special education in universities and with rehabilitation institutions. In the year 1960 separate projects were undertaken by the section of ID devoted to the research in teaching and

rearing the deaf children; e.g., to develop methods of work with deaf children of two to three years of age, preparatory to kindergarten, to collect and devise creative games for the development of oral and written language of deaf preschoolers. Special experiments were planned to improve phonematic perception and to correct pronunciation of the deaf preschool children with the aid of fingerspelling, flash cards with printed words, use of typewriting, etc. As a part of the 1960 program a study was made of the specific traits of mental and personality development of deaf and hard-of-hearing teenagers. In the other sections of ID, research was directed to the improvement of teaching processes of the blind, blind-deaf, brain-injured children and cases of speech disorders in the schools for normal children. (B.V.M.)

1131. BENDER, R. E., *The conquest of deafness*. Cleveland: Western Reserve Univ. Press, 1960. Pp 208.

This book is a review of the history of the education of the deaf from ancient to modern times. The author points out numerous inaccuracies associated with the history of deaf education, some of which have been perpetuated for ages. For example, the pronouncements of Aristotle with reference to deafness have been misinterpreted by virtue of taking sentences out of context and by changes in the original meanings of the Greek words for deaf and speechless, not only by writers of the past but even of the present era. The author has also clarified instances of mistaken identity relative to several educators of the deaf in the past century. Aside from the aforementioned contributions, the author has brought to light several individuals of the past whose work and writings have been neglected. Of particular note were the contributions of Hervas who commented on the superior lipreading ability of girls as compared to boys. The development of educational methodology of the deaf is traced in Europe, and the incidents recounted which led to the establishment of the manual method in the United States. (C.P.G.)

1132. CALDWELL, E. H., *Some adventures in language development*. *Volta Rev.*, 63, 1961, 60-64.

This paper discusses materials to be used with children five and six years old with bilateral losses of 60 db or greater. The paper discusses procedures for the organization and development of thinking plus ways of teaching better sentence construction and use of question forms with rising and falling inflections in a natural situation. The discussion of vocabulary covers nouns, pronouns, verbs, modifiers, prepositions, conjunctions and other parts of speech. Suggestions are also made of specific construction of sentences, reference materials within the classroom that are helpful to the child, and the need for good school-home communication. A notebook to be carried home daily by the child with the new language he has learned at school was suggested. The book is returned to the school each day with notes about the new language experiences he has had. (J.B.M.)

1133. COCHRAN, I., *What is a realistic curriculum for the deaf?* *Volta Rev.*, 62, 1960, 387-389.

A realistic curriculum for deaf children needs to be developed in the light of present educational research. It is a stimulating and rewarding experience for teachers to set down in black and white their beliefs, their goals, their methods, and their subject matter for teaching a specific group of deaf children. The Tulare County Teacher's Guide was developed by six teachers and their supervisor in a curriculum workshop over a period of 18 weeks. The outcome of this workshop was used for a year in the classes for the deaf in Tulare County, California, and published in final form under the title "Tulare County Teacher's Guide for the Educational Needs of Exceptional Children—The Deaf." (J.B.M.)

1134. EWING, I. R., and EWING, A. W. G., *New opportunities for deaf children*. Springfield, Ill.: Charles C. Thomas, 1960. Pp 149.

Intended as a replacement for the authors' earlier book *Opportunity for the Deaf Child*, 1945, the current book, written mainly for parents of deaf children, covers the many aspects of care and management from infancy through the school years. Though slanted toward the British reader in regard to school planning, the general discussions of the psychological aspects of

deafness in young children, what can be expected in the way of physical, mental, social, and emotional growth, methods for home training of the child, and new equipment and treatment methods will be of interest to persons working with deaf children [in other countries]. A considerable portion of the book is devoted to fairly detailed case histories of eight children who received early home training; the reports, with one exception, were written by the parents and emphasize the patience and persistence necessary in successful training of deaf children. (*Rehab. Lit.*)

1135. FALCONER, G. E., A mechanical device for teaching sight vocabulary to young deaf children. *Amer. Ann. Deaf*, 106, 1961, 251-257.

A mechanical device was developed to teach sight vocabulary to young deaf children through immediate positive reinforcement. In a study designed to evaluate the effectiveness of the machine as an aid in teaching vocabulary, eight profoundly deaf children with a median age of 6 years, 11 months were exposed to the experimental procedure for five minutes per day over a period of 10 days. A comparison of pre- and post-experimental session test scores showed a highly significant improvement in vocabulary. In addition, word retention tests, two weeks later, revealed almost perfect retention. (*C.P.G.*)

1136. GILLIAT, M. E., If I were teaching children again. *Teach. Deaf*, 59, 1961, 55-59.

A teacher of deaf adults at a hearing aid clinic discusses implications for improving lipreading, auditory training, and speech. The author has found from experience that an expressionless face and immobile lips as well as grimaces inhibit lipreading; continuous lipreading over an extended time may become exhausting; the essential imagery in lipreading is kinesthetic; necessary reinforcements for lipreading are speech and writing to avoid compounding grammatical errors; and with adjustments for tinnitus and recruitment, remnants of hearing should be utilized through amplification. (*M.S.K.*)

1137. GOLDBERG, H. R., Administering curriculum change. *Volta Rev.*, 62, 1960, 379-383.

This paper poses a number of questions to be asked by the teacher and the administrator concerning the terminology or vocabulary of a curriculum program. In addition, questions are asked that relate specifically to the field of deaf education. Suggestions are made for specific changes within the fields of mathematics, science, and social studies. Procedures are outlined to the administrator for ways of getting his staff together to motivate, guide and coordinate a program for curriculum change. Specific suggestions are made to try to help the administrator to aid his teachers in producing changes within the classroom that will improve the learning potentials of the children. (*J.B.M.*)

1138. HARRIS, N., A pilot study of parental attitudes as affected by early parent education. *Volta Rev.*, 62, 1960, 355-361.

As part of a description of the problems of parents of deaf children and various programs of parent education, an experimental program was conducted at the pre-school for the deaf of the Children's Rehabilitation Unit at the University of Kansas Medical Center. The program described concerns the parents of deaf children who had not participated in any form of parent education compared with a similar group after a year's intensive parent counseling. This program's unique emphasis was in conducting counseling sessions in a nondirective, parent-centered manner. A teacher of the deaf and a social worker served as resource persons for the parents' discussions of their feelings, attitudes, and technical information. It was felt that this type of program is better suited to meet the needs of this particular population. It was shown that the parents who had participated in the counseling program were less concerned with their personal reactions to their children's handicap and were more concerned and better able to plan and participate in the long term educational programs of their children. (*J.B.M.*)

1139. KORSUNSKAYA, B. D., Metodicheskie ukazaniya k ispol'zovaniyu daktil'noi rechi v obuchenii glukhonemykh doshkol'nikov. (Methodical instructions for

the use of dactylic speech in teaching pre-school deaf children.) *Spetsial'naya Shkola*, 97, 1960, 5-11.

Investigations into the results of teaching children have shown that all the possibilities of development of the deaf child are not realized, for the process relies chiefly on verbal speech and is limited by its phonetic bounds (despite constant use of printed cards) and does not use written speech, because of its technical complications. Verbal speech itself cannot be mastered by deaf children by direct intercourse, but only in a special way, needing much time and effort. There is no time for proper instruction in all the other forms of activity available to normal children. The use of fingerspelling was tried out teaching pre-school children and justified itself in many collective nursery schools for the deaf and dumb (allowing for some variation in pronunciation in the elementary stage). It should never be the final goal of education but only a means to speed up mastery of oral and written speech. *Rules for the use of fingerspelling:* The part played depends very much on the correct technique to be imitated; e.g., correct position of hands, absolute accuracy in reproduction of signs, arm on a level with thorax, hand turned to child, elbow immovable, with correct timing of pronunciation, which should be slow in first year. When speaking in sentences, make slight pauses between words and a longer one after a comma; stop at end of sentence. Accompany a question by writing the sign in the air and using the corresponding facial expression, and pronounce endings in words especially carefully. When a mistake occurs, repeat the *whole* word again. It is essential to make use of the table of fingersigns. Only an accurate imitated reproduction by the child of fingerspelling will insure the proper mastery, which is an essential condition of verbal speech. When the child reads a word or words himself and does not imitate the teacher's fingerspelling, mastery of the words is acquired more quickly. A new word is shown in its written form, and the child must fingerspell it from the table, then reproduce it from memory. After one year children can reproduce a new four-to six-letter word following two repetitions. After two years they can do this the first

time. After three years a single repetition of word or phrase is sufficient without the table. When using fingerspelling a child should pronounce the word aloud, as an aid to verbal speech. *System:* To accustom eyes to perception and hands to reproduction, first imitative exercises in movement; then exercises in reproduction of signs from the table, later words and short sentences; exercises in correlation of signs and letters; compilation of words from a cut-out alphabet of signs with the letters under them; exercises in sign reading of tables (in printed type) shown to the children; exercises in independent naming of objects and actions in fingerspelling; fingerspelling and independent speech at the same time. Mistakes are often due to bad techniques in grown-ups' fingerspelling. *Types of exercises to develop habit of fingerspelling:* Imitative exercises in reproducing individual signs, in groups, to train perception ("Do it this way"). Reproduction of signs by imitation ("Pick out one yourself and show it to us"). Many other exercises and games, like Lotto, are suggested. *Rules for development of habits of lipreading:* Articulation of teacher must be normal, with speech slightly slowed down. Pronunciation by syllables is not recommended; but systematic introduction of weekly speech "drill" (without fingerspelling) is recommended. When there is difficulty in understanding, repeat the whole sentence, not an individual word. Never replace grammatical form of the word by a more usual one (nominative or infinitive), but repeat the whole phrase. *Order of mastery of verbal material:* From signtable; from finger signs; from the lips, and to independent reproduction (verbally or by signs). *Rules for teaching of pronunciation:* Systematic speech drill in direct lessons with syllabic and word exercises. When speaking to the child orally, continually insist on oral pronunciation from him (even if only babbling at first). When reading dactylic language, demand vocal pronunciation from the child. In lessons on instruction in pronunciation, oral speech should be expected at the same time as fingerspelling. In the process of the work itself on a sound, word, or phrase, fingerspelling should not be allowed. Accurate pronunciation should be acquired on the same speech material by systematically introducing direct speech

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drill on a minimum of colloquial words and phrases without fingerspelling. When technique of fingerspelling is good enough to follow normal speed of verbal speech, children should practice accompanying simultaneous talking with hands and voice, with clear pronunciation of sounds mastered. Do not use words or phrases for verbal pronunciation, which the child cannot yet pronounce independently by signs. The teacher should have a record of all words accurately and approximately pronounced by the children and should keep a systematic record of all sounds and words mastered by each child. (H.G.W.)

1140. KORSUNSKAYA, B. D., Obuchenie rechi glukhikh doshkolnikov. (Teaching speech to deaf preschool children.) Moskva: Akad. Pedagog. Nauk, 1960. Pp 170.

The book is a guide to teachers and other personnel of kindergartens for deaf children between three and seven years of age. It was prepared by the author to fulfill the requirements of the new program of the Ministry of Education of the Russian Soviet Republic (RSFSR). This program is based on the findings of the 1954-1957 experiment in teaching preschool deaf children which was carried out by the Scientific-Investigatory Institute of Defectology in Moscow, for which the author of the book was one of the leading investigators. The expressed purpose of the new program is to step up the utilization of the child's capacities in order that later on, in the special grade school, he will be able to meet the requirements approximating those of the grade school for hearing children. (See Abstract 840) According to this program the deaf child after the completion of the three year course, is supposed to speechread and talk simple phrases about his daily routine, the objects surrounding him, his activities in games, arts, crafts, and physical education. The child is taught to use elementary concepts of time, space, number, color, size and form, and to differentiate verbally the objects according to their characteristics and similarities. Since the pronunciation of many sounds and words is inaccessible to him at the beginning, auxiliary methods are used to pave the way to the development of oral language. The auxiliary methods are the use

of flash cards with printed words and fingerspelling. Both methods are used interrelatedly and have an advantage of providing him with all the vocabulary for communication and learning he needs at this period. At the same time the systematic training in speech and speechreading proceeds in special lessons on the basis of words already mastered from printed cards and by fingerspelling and the child learns to utter words while fingerspelling. As the intelligibility of his speech and the ability to speechread are improved he resorts to fingerspelling only with new or difficult words. In the supplement to the book the author gives detailed material and procedures of lessons for the beginners, intermediate and advanced group and describes visual aids, games and other activities. (B.V.M.)

1141. LOHMANN, G., Hearing and vision conservation programs in Iowa schools. *Nursing Outlook*, 8, 1960, 684-685.

The author describes a cooperative effort between the division of special education in the state department of public instruction and the division of public health nursing in the state health department. Representatives from each division formed a joint committee to work out the details of a guide that helped delineate the responsibilities and functions of special education supervisors and public health nurses relative to the hearing and vision conservation programs. The author emphasizes the importance of clarifying among school personnel the respective roles of the various professional employees. (J.L.S.)

1142. LÖWE, A., Pädaaudiologische Beratungsstelle für Eltern gehörgeschädigter Kleinkinder. (Pediatric-audiological advice bureaus for parents of young children with hearing defects.) *Neue Bl. Taubs.*, 14, 1960, 65-75.

Home training for parents of preschool deaf babies was started in Heidelberg after the Manchester convention, but it proved impossible to cover all the demands. Therefore, the first German bureau for these parents was opened, in which screening and diagnostic hearing tests are given. Specifically, in audiometric testing the peep show, railroad and the block test, as well as pure tone and speech audiometry, are used.

Moreover, intelligence, maturity and performance tests are given. The parents are given instructions for home training. They visit the bureau four times a year and are visited at home another four times. Speech-provoking games at home are most successful. Between two and six families can be visited every day. The clinic operates independently from the schools; there is, however, close cooperation with these and other organizations. Special information: deaf babies start walking later (about two years) which is favorable for early speech-reading; earlier training of residual hearing gives the best result; normally intelligent deaf children can start reading at the age of four. (*B.Tb.T.*)

1143. MAESSE, H., Die Ausbildung der Taubstummlehrer in Hamburg. (The training of teachers of the deaf in Hamburg.) *Neue Bl. Taubss.*, 14, 1960, 37-42.

The University of Hamburg is in charge of the theoretical and scientific part of the training. The practical training consists of one-half year of work at a school for speech correction, one-half year at a school for the hard of hearing, and one year at a school for the deaf. There should be a close cooperation between theoretical teaching and practical training. The author lists the requirements for the final examinations extensively. (*B.Tb.T.*)

1144. MANGAN, K. R., What is a realistic curriculum for deaf children in regular classes? *Volta Rev.*, 62, 1960, 386-387.

The author states that since deaf children vary from each other at least as much as hearing children differ from one another, no single standardized plan of education will meet the needs of all deaf children. Many deaf children can be stimulated to superior achievement in a program which combines the challenging atmosphere of a regular class with the special teaching procedures of a class for the deaf. He cautions that in the rush toward "normalization" teaching of educational skills may be slighted. Extreme care and constant re-evaluation should be exercised in any program integrating handicapped children into regular classes. The course of study which prepares a child for academic integration includes careful teaching of the child, using adapted materials which present language

in a more logical and efficient sequence than do ordinary materials. He points out that the curricular materials prepared for hearing children offer a source of ideas for improving the offerings for deaf children. (*J.B.M.*)

1145. MARKELL, A., Teaching deaf children to dance. *Volta Rev.*, 63, 1961, 176-177.

This article presents an instructor's experiences with deaf children in teaching them to dance. Through dance instruction deaf children develop a means of creative expression of ideas; their lives are broadened through enjoyment of the dance. The author discusses his enjoyment of working with these children. (*J.B.M.*)

1146. McLAUGHLIN, H., Administering curriculum changes: the supervisor's viewpoint. *Volta Rev.*, 62, 1960, 384.

The author points out that in a school for the deaf, there are two curricula: one pertaining to general subjects and the other to subjects involved in deaf education. In the New York City schools for the deaf, the faculty follow the curriculum for the regular schools. Before they put these curricula into effect, they discuss them, work them over, and find out whether or not they are adaptable for children who are deaf. Time is given the teachers to meet together and discuss and coordinate their programs at each level with the supervisor. The author feels that any curriculum change is a responsibility of all school personnel, as well as the parents. Conferences also are held with the parents to acquaint them with the curriculum changes. (*J.B.M.*)

1147. MORKOVIN, B. V., Through the barriers of deafness and isolation. Oral communication of the hearing impaired child in life situations. New York: Macmillan, 1960. Pp 178.

Medical, audiological, psychological and educational steps to habilitation of a hearing impaired child, described by various contributors, are interrelated and interpreted throughout the book by the author in the light of a functional "life situation" approach. It is the author's thesis that only by the utilization of the child's total potentialities can effective habilitation be achieved. O. H. Mowrer in the foreword gives a

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psychological basis for the functional approach to teaching language to hearing impaired children. The otologist's role in hearing conservation and prevention of deafness is delineated by N. Canfield. The audiologist, E. W. J. Johnson, father of a deaf child, emphasizes the importance of the early use of hearing aids, preferably binaural, and its effect on the child's development. The indispensability of psychotherapy for parents of the deaf is brought out by Alathena Smith of the John Tracy Clinic in her case study. Two mothers give an account of the integration of their small deaf children into the family's every day routine. Speech, speechreading and language are developed by the teachers of kindergarten and grade schools of various types, by the use of multisensory training: auditory, visual, tactile, kinesthetic and rhythmic. Oral language becomes an active tool of learning and communication by means of its use in various activities, games, excursions and in intensive classroom work with audiovisual aids. In his short autobiography, J. P. Marsters, deaf from childhood, reports how early in life he chose the "hearing world" and worked together with teachers with perseverance on the development of his oral language. This language enabled him to study in college and to become successful in his professional career of orthodontist. Each chapter of this book is provided with a bibliography, and the supplement gives lists of periodicals, for use of parents and teachers, of specialized services of different agencies and of addresses of residential and day schools for the deaf and hard of hearing. Indexed. (*Author's summary*)

1148. MULHOLLAND, A. M., *Concept formation and the curriculum*. *Volta Rev.*, 62, 1960, 389-392.

The importance to curriculum planning of deaf pupils' potential attainment is stressed in this paper. Understanding of self and of nature, acquisition of information, and other knowledge is dependent upon several factors: mental capacity, linguistic competency, and social and emotional maturity. The teacher's skill in development of understanding through experience is also important. The author lists a series of steps that must be taken before concepts can be attained. First, sensation,

perception, imagery, symbols, and then concepts are formed. She briefly reviews the literature showing that the deaf child is very poor in abstract thinking. She emphasizes that for the deaf child to reach his greatest potential, there must be conscious effort on the part of the teacher and the administrators to evolve the kind of curriculum and to utilize methods and techniques which will develop and improve the child's thinking. Thinking, she defines as a series of ideas originating in a stimulus, internal or external, and influenced by a variety of motivational forces. She also emphasizes that nonverbal materials presented pictorially may be used to form concepts. Various levels of concept formation from concrete to abstract are illustrated. (*J.B.M.*)

1149. NATIONAL INSTITUTE FOR THE DEAF, *In the interests of deaf children*. *Teach. Deaf*, 59, 1961, 20-23.

Groups working with the deaf report on aspects of deaf education to be studied in the British Isles. Problems of definition, educational placement, language, manual communication, secondary education, training related to employment, and 14 points formulated in 1958 of basic interest to the education of the deaf are included. (*M.S.K.*)

1150. NEAS, J., *A day class program trends in achievement and curriculum growth*. *Volta Rev.*, 62, 1960, 347-350.

This paper discusses the integration of acoustically handicapped children into the regular classroom. The paper stresses the way in which the special teacher and the regular teacher have worked together to improve each other's instruction and, in turn, to help each of the children to a greater degree. A number of questions are posed that might be answered by basic research into the problems of the acoustically handicapped child. (*J.B.M.*)

1151. O'CONNOR, C. D., *The integration of the deaf in schools for the normally hearing*. *Amer. Ann. Deaf*, 106, 1961, 229-232.

The primary purpose of the investigation was to determine the degree of successful or unsuccessful adjustment of deaf students integrated into hearing schools and the factors influencing success or failure. 18 trans-

fer students were subjected to intensive study. In addition to detailed interviews with teachers, principals, and parents, the subjects were administered a battery of tests consisting of the WISC, standard pure-tone audiometry, Stanford Achievement Tests and the Brunschwig Personality Inventory. The results supported previously held assumptions concerning the success or failure of hearing-impaired children in educational programs for the normally hearing: (a) children with congenital hearing losses which exceed 60-70 db in the speech range cannot successfully integrate with hearing children at age five or six; (b) the number of children in schools for the deaf who are candidates for educational integration is small; (c) no student in general is ready for transfer to regular classes until age eight or nine, and (d) the pupil's age, communication ability, intelligence, personality makeup, attitude of parents, and the type of program to which he will be transferred are important factors in ultimate success. (C.P.G.)

1152. O'CONNOR, C. D., Keynote speech of the parents' section. *Volta Rev.*, 62, 1960, 392-396.

A review of the historical events, trends, and development of the past 150 years in America that have affected the opportunities for deaf children. (J.B.M.)

1153. PARUPZ, A. M., Shkoly glukhonemykh Latvuskoi S.S.R. (Schools for the deaf in the Latvian S.S.R.) *Spetsial' naya Shkola*, 99, 1960, 87-88.

Three phases are apparent in the development of Latvian Schools for the Deaf (a) pre-Revolutionary, 1880-1917, (b) during the Capitalist period, 1919-1940, and (c) in Soviet Latvia, since 1940. In 1890, the Courland Society for the Deaf and Dumb persuaded the government to set up the Elgava District School (now at Mitava). In the area were about 120 young deaf children but only 20 could be schooled. Later in Lifland province the Valmiera District School was established for about 40 pupils. The City of Riga had its own school for 70-80 pupils and later became residential. The deaf gained much during the second period, for the three schools were augmented and a school for older pupils was opened in Viteba province, called Laizana

State School. In each school and in each class there were many different categories of deaf children. At the beginning of the Soviet period (1940) the deaf, the hard of hearing and the deafened were still taught together, but now some attempt at classification is being made with schools for different categories of deaf children. During the period 1919-1940 there was a ten-year course; since the Soviet period there is a nine-year course. In the Riga School there are extra classes, though most pupils leave before this senior work. Many problems presented themselves after the war and some were answered by the expansion of the Riga School. In 1944, Riga School held only 80 pupils; it was not since 1897-98 that so small a school had existed there; by contrast in 1954-55 the school had 161. Elgava School actually served the town of Elgava itself but now an Elgava Boarding School for young deaf children is about 20 kilometres from the town. The Latvian State Society for the Deaf and Dumb has its headquarters in Riga. Branches exist in other towns also. The Society has its own factory and artel where they train deaf school leavers. The Society also has its own special funds for assisting cultural work and its own club where the deaf can meet for various activities in pleasure and education. (H.G.W.)

1154. PRITCHARD, L. H., The high school for the deaf. *Teach. Deaf*, 59, 1961, 5-13.

Recollections of life in one of the longest established private oral schools for the deaf (1886-1945) is described by a former student. Average enrollment between 1918 and 1939 was from 21 to 24 pupils. There were three classes: Senior and Middle Forms, usually consisting of six students each, and Juniors taught by a resident lady teacher. Articulation and lipreading were stressed under all conditions. (M.S.K.)

1155. PUGH, B. L., Developing the deaf child's power of reasoning. *Volta Rev.*, 62, 1960, 334-340.

Studies that have been made of the development of the mental processes both in normal and in deaf children are at variance and inconclusive. Piaget theorizes from his clinical investigations that the mental life of a child is characterized by

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four well-marked phases and that the stage at which formal reasoning on the verbal plane becomes possible is not reached until the age of 11 or 12. Susan Isaac's analysis of remarks made by a group of school children over a three-year period of time led her to quite different conclusions. The author's experience in teaching deaf children over a long period of time has convinced her that deaf children's reasoning powers can be greatly increased through definite instruction in how to reason. Some of these instructions are (a) provision for a wide range of worth-while experiences explained in language, (b) establishing clear-cut associations between verbal concepts and all visual-concept information, (c) promoting the ability to detect verbal absurdities as well as picture absurdities, (d) specific training in using contextual clues in reading and presenting clearly defined steps in teaching the use of the dictionary, (e) developing an understanding of the concept of reciprocal relationships at successively higher levels, (f) provision for more practice in following directions which become progressively more complicated, (g) practice in reasoning by the process of elimination versus guessing, (h) practice in way to transfer information to new situations. (J.B.M.)

1156. PUGH, B. L., Teaching children to use the dictionary. *Volta Rev.*, 63, 1961, 178-185.

This paper gives a detailed description of the procedure for starting very young deaf children to use the dictionary. The teacher should develop in the child the abilities to alphabetize, to find and select substitutes, to make structural changes. The dictionary can be one of the very best friends of the individual who is deaf and, as the author states, "... scientific studies show a high positive relationship between success and the size of one's vocabulary, systematic training in the efficient use of the dictionary should be emphasized." Suggestions are given for developing some concepts from the dictionary and also about methods of teaching certain language concepts. (J.B.M.)

1157. REES, E., Wir und die Technik. (We and technical science.) *Neue Bl. Taubs.*, 14, 1960, 9-16.

Technical science has made its entrance into our field of teaching; it seems that Germany lags behind. The danger of the technical progress is that some expect too much from it in the way of a final solution, and do not estimate its correct value. The main task still is to raise the deaf child's capacity of formulating his thoughts in spoken language. To call congenitally, totally deaf children "gehorlos" (without hearing) and not "taubstum" (deaf mute) categorizes them less characteristically and indicates a tendency to neglect them in favor of those who can be reached with technical equipment. Yet, these born-deaf children always have been and should be the real challenge of the profession. (B.Th.T.)

1158. ROBERTS, G. D., Parent-school relationships. *Volta Rev.*, 62, 1960, 449-451.

The author reviews the methods by residential schools, university and hospital clinics and state agencies to provide services for parents of children with impaired hearing. These methods include: (a) classes and correspondence courses, (b) parent institutes, (c) information series, (d) distribution of information through national associations, (e) clinic and agency participation, and (f) discussions among parents themselves. The author writes that schools have the responsibility to cooperate in these various programs of parent education. School personnel should strive to acquire new skills and knowledge. Teachers particularly need education in techniques of counseling and interviewing so that parent-school relationships may be improved. Teachers should be honest in reporting to parents and objective in counseling them. (J.B.M.)

1159. ROSENKRANZ, F., Schleiz. *Neue Bl. Taubs.*, 14, 1960, 28-36.

The little school for the deaf in Schleiz, Thüringen has been closed. The memory of this school is inseparably connected with Christian Kaiser. The methods used there were typically German in the Vatter tradition: speechreading, speaking, writing; in Vatter-type key-work; in motoric training; in pure oral method. (B.Th.T.)

1160. STONE, L. J., FIEDLER, M. F., and FINE, C. G., Preschool education of

deaf children. *J. speech hearing Dis.*, 26, 1961, 45-60.

The effects of a liberalized and enriched preschool program for deaf children were studied in an experimental group of 12 and a control group of 15 children who preceded the experimental group by one year in school. The experimental group program emphasized (a) nursery school procedures modeled on the best practices with hearing children, with speech and language teaching in the context of natural play, and (b) early use of individual hearing aids. The control group was taught by the more formal procedures characteristic of preschool classes before inauguration of the new program. Various measures of speech production and perception, academic progress and personality growth were used to evaluate the achievements of both groups. Most of the measures reported were made when the E group was in second grade. In all measures the experimental group proved superior in performance to the control group, although (except for academic measures) a year younger and with one less year of schooling than the control group. The consistent use of individual hearing aids appeared to be an important factor in producing superior achievement in speech. Analysis of the data suggests, however, interdependence between teaching method and the wearing of hearing aids. In academic achievement as estimated by quantity and quality of books read in third grade, liberalized teaching methods appeared especially important. Evidence of observational data, as well as of more objective data from play studies, showed the children in the experimental group achieving happier school adjustment, in general, and more healthy personality development than children in the control group. (*Authors' summary*)

1161. TOTOKI, A., Nippon Rowa Gakko, the Japanese oral school for the deaf, Tokio. *Teach. Deaf*, 59, 1961, 42-47.

A private oral school for the deaf, established in 1917, with an enrollment of 174 in 1960, is described. The program extends from preschool with classes for children two and three years of age up through senior high school. Auditory equipment designed after that at the laboratory of Central Institute for the Deaf, St. Louis, is

used. The difficulties encountered by the deaf children in learning to lipread, speak, and write the stylistic differences of the Japanese language are discussed. (*M.S.K.*)

ETIOLOGY AND PATHOLOGY

1162. BELLO, J. A., APARICIO, B. C., and EMILIANI, M. M., *Etiología de las sorderas afemizantes, tipos audiometricos.* (Etiology of aphemic deafness, audiometric types.) *Fono Audiol.*, 6, 1960, 190-201.

The authors correlate audiometric types with site and type of lesion. 120 children with hypoacusia and brain injury resulting in disturbed language are divided into three etiologic groups. Group I includes the hereditary forms, mutations, *neurolab-inticas*, otosclerosis, and endemic cretinism. Group II includes forms acquired during the prenatal period, rubeola in third trimester, and Rh incompatibility. Group III includes alterations in hearing occurring at the moment of birth, cyanosis, prematurity, and forceps injury. Three types of audiograms are correlated: a flat loss, a distorting loss for high frequencies, and residual hearing for the low tones only. The correlated etiologic factors were: pathologic agents affecting an embryonic organ not fully developed; those affecting an organ immediately before, during or after birth; and those affecting the genetic determinants. Maternal rubeola is presumed to inhibit the development of the embryonic cochlea, resulting in a flat loss. Anoxias occurring close to term affect the fully developed cochlea and impair high-frequency response. Icterus attacks the dorsal cochlear nucleus primarily, resulting also in a high frequency loss. This is attributed to the phylogenetic recency of the dorsal cochlear nucleus, and thus its greater vulnerability. Furthermore this nucleus is more exposed, protruding in the floor of the fourth ventricle and also happens to belong to a highly vascularized portion of the reticular system with attendant vulnerability to hemolytic agents. Considering hereditary hearing losses, the non-cochlear low-frequency response of the sacculus is speculated upon. This is offered to account for the perception of the low frequencies only. In summary, the flat losses are related to rubeola and streptomycin. The remaining types are hereditary recessives, shallow

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sigmoid losses due to cyanosis and to Rh incompatibility, and the abrupt losses for high tones due to moderate cyanosis and hemolytic agents. (M.S.W.)

1163. BICCILOLO, C., and CECCAR-ELLI, A., Reperti cocleo-vestibolari ed elettro-nistagmografici negli esiti di poliomielite. (Cochleovestibular and electro-nystagmographic findings in patients with sequelae of poliomyelitis.) *Il Valsalva*, 37, 1961, 23-32.

The cochleovestibular function was studied by the authors in 11 spinal and 21 bulbo-spinal polio patients, all of whom [were] in a stage of stabilization of paralysis. The cochlear function proved to be uninjured in all of the cases, while the vestibular one showed more or less strongly marked alterations in the patients affected with bulbospinal forms. The authors reproduce the electronystagmographic tracings in relation to the thermic stimulation. (Authors' summary)

1164. BORSANYI, S., BLANCHARD, C. L., and THORNE, B., The effects of ionizing radiation on the ear. *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 255-262.

Fourteen patients received 4000r and 6000r radiation in the region of the cochlea during treatment with cobalt 60. A few patients showed small but significant changes in auditory threshold. Increase in sensory-neural hearing loss is probably not due to microscopically detectable changes in the cochlea, but to altered metabolism or increased endo- or perilymphatic pressure due to transient vasculitis. (R.G.)

1165. BRILL, R. G., Hereditary aspects of deafness. *Volta Rev.*, 63, 1961, 168-175.

A review of the literature concerning various causes of hearing losses. The author feels that as a result of better medical care, medication, and understanding of problems there has been a reduction in the number of children who have acquired deafness and an increase in the number of children who are deaf as the result of the hereditary factor. The author reports that at the California School for the Deaf at Riverside there is strong evidence of endogenous factors in 68% of the cases. This seems to be in line with the expected change from the 60-40 ratio in the 1920s and 1940s. The

paper also reports changes in the causes of adventitious deafness as listed by the parents on their application forms over a period of years. The paper discusses some of the pitfalls in accepting the report of the parents regarding causes of deafness. The conclusion is reached that the proportion of endogenous deafness to exogenous deafness has increased, and that more children in schools for the deaf have a hereditary than acquired hearing loss. (J.B.M.)

1166. DE SANTIS, M., and DI GIROLAMO, A., Sulla patogenesi allergica della malattia di Ménière. (On the allergic pathogenesis of Ménière's disease.) *Il Valsalva*, 36, 1960, 336-350.

After a critical examination of the clinical and experimental data usually considered as proofs of the allergic etiology of certain forms of Ménière's disease, the authors point out that these arguments cannot be considered as definitive. All the clinical theories and laboratory results, in fact, leave the door open to numerous perplexities although on the whole the allergic theory is still not only acceptable but also attractive in that it is the only one that explains some of the features of these labyrinthopathies. In an attempt to prove or disprove the possibility of an allergic etiopathogenesis in Ménière's disease, the authors have carried out research on the histaminopexic power of the blood serum as an allergy test in 28 subjects. In 15 subjects the presence of an allergic terrain could be shown. There were doubtful histaminopexic values in six patients, and in seven subjects the existence of an allergic terrain was to be excluded. (Authors' summary)

1167. EVERBERG, G., Etiology of unilateral total deafness. Studied in a series of children and young adults. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 711-730.

The etiology of unilateral total deafness in children and young adults was thoroughly studied clinically, radiologically, and genetically in a series of 122 individuals. . . . Hereditary factors were demonstrable in about 25%, consisting in the occurrence of all degrees of severity of endogenous perceptive lesions, but mainly severe ones, in the families studied, and by a predisposition to acquired deafness in a few families.

The transmission was by irregular dominant inheritance. In 21 instances (17%), the disease appeared to be acquired, due to meningitis in 11 cases, mumps in 5 cases, otogenic labyrinthitis in 2, scarlet fever in 1, and head injury in 1. Lastly, 1 case occurred as sudden idiopathic deafness. Prenatal, natal and neonatal causes could not be demonstrated. In 9% the X-ray appearances revealed that the lesion was due to developmental anomalies. In about 50% the etiology was not demonstrable. Brief mention is made of the relationship between vestibular findings and X-ray appearances of the inner ear on the one hand and etiology on the other. Abnormal findings were made in this respect in 50% and 35% respectively in the acquired group and in 25% and 15% respectively in the congenital group. [39 references.] (*Author's summary*)

1168. GOLDSTEIN, R., LANDAU, W. M., and KLEFFNER, F. R., Neurologic observations on a population of deaf and aphasic children. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 756-767.

A neurologic study was carried out upon 183 children in a school for the deaf and aphasic. The tests included medical history, neurologic examination, EEG, skull X-rays, audiometric studies, psychometric tests and vestibular function tests. Where available, etiologic factors were also correlated with clinical and laboratory findings. . . . (*Authors' summary*)

1169. GOZUM, E., Delayed cochlear damage in stapes surgery. *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 171-175.

Among 120 patients on whom various forms of stapes surgery had been performed in one year, three patients developed 'delayed cochlear damage' as manifested by vertigo and/or increased hearing loss: two of them in about three weeks who showed fistulas on re-examination, and the third in about 10 months presumably as the result of local cochlear toxicity. (*R.G.*)

1170. HERRMANN, R., Zur Pathogenese des Mittelohrcholesteatoms. Die Entstehung-sursache randständiger Trommelfelldefekte und die einheitliche Deutung der chronischen Mittelohrentzündungen. (Pathogenesis of the cholesteatoma of the

middle ear. Causes of marginal defects of the drum, and the uniform diagnosis of chronic middle ear inflammations.) In L. Rüedi (Ed.), *Fortschritte der Hals-Nasen-Ohrenheilkunde* (Advances in Oto-Rhino-Laryngology). Vol. VII. Basel: S. Karger, 1961. Pp 153-216.

Apart from chronic tubo-tympanic catarrh and chronic mucosal suppuration, cholesteatoma of the middle ear is a special form of chronic middle ear inflammation; its characteristics are a hyperplastic mucosa and inhibited pneumatization of the mastoid. Chronic mucosal suppuration is always associated with a central perforation of the tympanic membrane whereas in the case of cholesteatoma, a marginal perforation occurs from which the epidermis of the meatus or of the drum extends into the middle ear space. In primary cholesteatoma there is a cushion of hypertrophied epidermis in Prussak's space into which Shrapnell's membrane bulges. On the other hand, the occurrence of a marginal perforation in secondary cholesteatoma could so far not be adequately explained as long as there is not total defect following necrotizing otitis. The author's clinical and histological investigations have shown that the small marginal perforations in the supero-posterior quadrant are the result of an osteitis extending from the attic into the meatus. The bony plate of the tympanic ring separating the attic from the mesotympanum is often very thin and scaly so that it is easily involved by an inflammatory process, thereby producing a defect in the drum. These small marginal perforations are always associated with a defect or separation from the bone of the annulus fibrosis; thereby the epidermis of the tympanic membrane and of the external auditory meatus respectively is brought into contact with the sub-epithelial connective tissue of the middle ear. This defect of the annulus can only occur through an osteitis. Secondary cholesteatoma occur by the same inflammatory process not only posteriorly but occasionally also in front of Shrapnell's membrane because the attic extends forward and backward beyond the limits of Shrapnell's membrane; the anterior origin of the membrana tensa near the anterior meatal spine is often formed by a particularly thin piece of bone. Primary

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cholesteatoma should be diagnosed only where there is a perforation confined to the membrana flaccida. The rare cases of cholesteatoma in the presence of a well defined pneumatized mastoid which may occur after injury or an operation on the middle ear are often quoted to refute the classical theory of cholesteatoma formation (with a sclerotic mastoid); they can, however, also be explained by assuming that the epidermis of the deep meatus has special powers of proliferation. The author's new observations concerning the formation of cholesteatomata enable him to put forward a comprehensive explanation of the pathogenesis of all cases of chronic otitis media. Thus, chronic otitis media leads to marginal perforation and thereby to the first stage of secondary cholesteatoma when certain anatomical conditions in the attic are fulfilled. This is the case when the upper part of the tympanic ring is very thin and therefore susceptible to development of osteitis. Other facts, such as poor or impaired drainage and secretion in the attic, may predispose to a break-through into the meatus as occasionally there is a bony ridge separating the attic from the rest of the middle ear. In other cases, the inflammatory process remains confined to the mucous membrane, and the drum is damaged at its thinnest part, namely in the central portion. On clinical grounds one can distinguish several forms of chronic otitis media because the localization of the perforation has been a useful criterion and helps in the assessment of the condition. It is not quite clear yet which factors are concerned in the occurrence of chronic tubal disease, of chronic mucosal suppuration and of cholesteatoma. The most important factor may be the condition and susceptibility of the middle ear mucosa. This paper, however, shows that there are variations in the anatomy of middle ear spaces, which may account for the particular form the chronic otitis media takes. [21 illustrations.] (*Author's summary*).

1171. JACKS, R. L., Sound suppression in the chemical process industries. *Chem. Eng.*, 68, 1961, 127-134.

The author cites noise ambients in various industrial situations, relating them to annoyance and masking levels, and to cochlear pathologies due to chronic and acute

exposures. He then discusses corrective procedures such as sound-isolation of the offending operation, noise damping, noise absorption, and the design of less noisy machinery. (*M.S.W.*)

1172. KOIDE, Y., KONNO, M., YOSHIDA, Y., YOSHIDA, M., NAKANO, Y., NAGABA, M., and MORIMOTO, M., Some aspects of the biochemistry of acoustic trauma. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 661-697.

The oxygen tension in both the inner ear and the brain cortex has decreased during the exposure of an animal to a higher level test tone, while shock waves had no effect. One of the effects of a lower level test tone on the inner ear was an increase in the glucose content of perilymph. It is assumed that the increase reflects the changes in the circulatory conditions within the inner ear. . . . The electron microscopy and histochemical studies have revealed that the earliest changes in the outer hair cells caused by sound stimulation are the morphological changes of the mitochondrial structure of the apex, and that, under these conditions, oxidative phosphorylation probably controls the above changes. [77 references.] (*Authors' summary*)

1173. LINDSAY, J. R., DAVEY, P. R., and WARD, P. H., Inner ear pathology in deafness due to mumps. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 918-935.

The histopathological changes in the temporal bones of a well documented case of bilateral deafness due to mumps have been presented. No previous description of the histopathology has been found. The degenerative changes consisted of atrophy of the stria vascularis, tectorial membrane and organ of Corti. The degree of atrophy progressed from mild changes in the apical coils to total loss of these structures in the lower, middle and basal coils. The pathologic process is the inner ear was confined to the structures within the endolymphatic system of the cochlea, and may be designated best as an endolymphatic labyrinthitis due to the mumps virus. [32 references.] (*Authors' summary*)

1174. LINDSAY, J. R., SANDERS, S. H., and NAGER, G. T., Histopathologic observations in so-called congenital fixation of

the stapedial footplate. *Laryngoscope*, 70, 1960, 1587-1602.

Histopathologic studies were made of the temporal bones of a clinically deaf man with congenital fixation of the footplate. No audiometric data are presented. The footplate failed to develop normally and there was "extensive persistence of the continuity of the lamina stapedialis . . . with the otic capsule." The crura were also anomalous. There was no evidence of an otosclerotic process. (R.G.)

1175. MANSON, M. M., LOGAN, W. P. D., and LOY, R. M., Rubella and other virus infections during pregnancy. Reports on Public Health and Medical Subjects. No. 101. London: H. M. Stationery Off., 1960. Pp 101.

Based on data gathered in a prospective survey by local health authority officers in England, Scotland, and Wales from 1950 through 1957, the report analyzes conclusions from findings in more than 7,000 completed cases and controls under review. Two conclusions of importance were demonstrated: that risk of rubella in early pregnancy leading to birth of a malformed infant is much less than earlier studies indicated, and that children born of mothers with a history of rubella during pregnancy should be kept under observation to detect the possible occurrence of deafness. Other virus infections studied did not have the same harmful effects on the fetus as did rubella occurring during the first trimester of pregnancy. Malformations of the heart, cataract, and deafness were the most common defects noted in children studied for this report. Earlier retrospective and prospective studies made in various countries are reviewed briefly in the introduction. (Rehab. Lit.)

1176. McGEE, T. M., Streptomycin sulfate and dihydrostreptomycin toxicity. *Trans. Amer. Acad. Ophthalmol. Otolaryngol.*, 65, 1961, 222-228.

"The lesion in streptomycin and dihydrostreptomycin toxicity is limited to the inner ear. Streptomycin sulfate and dihydrostreptomycin both damage the vestibular end organ. They do so in a selective manner in the cat, where the cristae appear to be less resistant to toxic changes than do the maculas of the saccule and the utricle. Di-

hydrostreptomycin toxicity is associated with a delayed permanent loss of hearing which can occur several weeks to several months following treatment with the drug." In G. E. Shambaugh, Jr.'s discussion of this paper, he calls attention to the inclusion of dihydrostreptomycin in many commercial combinations of antibiotics, the trade names of which failed to indicate the presence of an ototoxic drug. He lists several of these combination drugs which contained between one-quarter and one gram of dihydrostreptomycin with 400,000 to 900,000 units of penicillin per dose. In some cases the antibiotic was given not as a life-saving measure for serious diseases but for a mild self-limiting infection, such as the common cold, or prophylactically to uninfected surgical patients. The prescribing physician usually had no idea of the risks to the hearing and, since the deafness began weeks or months later, he was not aware of the irreversible hearing loss when it developed. Following the publication in *J.A.M.A.* of an article on dihydrostreptomycin deafness which was sponsored by the Committee on the Conservation of Hearing, a number of drug companies withdrew this drug from various commercial combinations of antibiotics. Since streptomycin is equally effective against gram-negative bacteria and, in effective therapeutic doses is safe as far as hearing is concerned, there is no reason, in Shambaugh's opinion, for continuing the manufacture and sale of dihydrostreptomycin. (M.H.M.)

1177. McGOVERN, F. H., The association of nerve deafness and retinitis pigmentosa. Interval report. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 1044-1053.

A twenty-year progress report of four brothers with the association of nerve deafness and retinitis pigmentosa is presented. The audiometric survey showed little change in the type and amount of hearing loss. The vision showed the deterioration characteristic of the course of retinitis pigmentosa. A review of the pertinent current literature is also recorded. (Author's summary)

1178. PARKE, DAVIS and COMPANY, Patterns of disease. Special report: hearing disorders. Detroit: Author, Dec., 1960.

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monthly publication for the medical profession highlights incidence and degree of hearing loss by age groups, as well as causes of hearing impairment. Information is presented in statistical tables with explanatory text. Use of testing devices for detection of loss, the effect of environmental noise on hearing, use of hearing aids, and the value of surgical treatment for deafness are covered also. (*Rehab. Lit.*)

1179. PRICE, J. J., Management of the pregnant Rh negative female. *Penn. Med. J.*, 63, 1960, 1632-1637.

A summary of the latest concepts in diagnosis and management of the pregnant Rh negative, sensitized female. Hereditary aspects, diagnostic methods of testing for antibodies, and the ABO incompatibility and its diagnosis are discussed. 35 references. (*Rehab. Lit.*)

1180. ROBINSON, M., Stapedial fracture following head trauma. *Laryngoscope*, 71, 1961, 181-184.

A case report is given of a woman who sustained a hearing loss, primarily conductive, following head trauma. The ear was explored 11 months after the accident. An incomplete incudostapedial disarticulation was noted as well as fracture of both crura at the footplate. Surgical conditions warranted stapedectomy, replacement of the footplate with a vein graft, and insertion of a polyethylene strut between the incus and vein graft. Hearing was improved by an average of 40 db in the speech range to a level of 25 db. (*R.G.*)

1181. SAPORITI, E. M., El mecanismo fisiopatológico tubario en la producción de las hipoacusias. (The mechanism of tubarial physiopathologies in the production of hypoacusias.) *Fono Audiol.*, 6, 1960, 155-167.

The eustachian tube allows the ear cavities to keep a tensional equilibrium with the exterior, thanks to the air circulation which takes place through it. It allows the easy vibration of the tympanum and easy movements of the ossicular chain with which the conduction of sound is carried out without difficulty. But when the tube is blocked, it always remains open or it is unable to answer quick demands in the rough pressure changes, the functioning of the ossicular chain and tympanum is altered,

with the resulting of an . . . immediate hypoacusia of transmission which is reversible if it is treated in time, but if prolonged will attack the cochlea. Tubarial stenosis as well as aero-otitis obey a similar obstructive mechanism which sinks the membrane against the inner wall of the antrum, immobilizing the ossicular chain. On the other hand, the tube permanently open acts in the production of hypoacusia because of the masking resulting from breathing, mastication, and the continuous pressure changes in the nasopharynx. (*Author's summary*)

1182. SCHULTHESS, G. VON, Innenohr und Trauma mit besonderer Berücksichtigung des Krankheitsverlaufes. (The inner ear and traumatic disturbances with special consideration for the prognosis of the disease.) In L. Rüedi (Ed.), *Fortschritte der Hals-Nasen-Ohrenheilkunde* (Advances in Oto-Rhino-Laryngology). Vol. VII. Basel: S. Karger, 1961. Pp 1-152.

Acoustic trauma has in the last 20 years become a fairly well defined diagnostic entity. On the other hand, our knowledge of the pathology of traumatic inner ear disturbances is still very incomplete. The physiological phenomena of adaptation and fatigue of the perception apparatus constitute a theoretical basis for studies of the end organ under stress. "Transient raising of the threshold of hearing" (TTS) and "permanent hearing loss" (PHL) can be investigated clinically as well as by animal experiment. The common view that there is a relation between these two factors of post-traumatic hearing impairment has not been proved so far. To resolve these problems is one of the important aims of research. The hearing threshold can be determined relatively easily in suitably conditioned cats and the recovery after acoustic injury can be measured. When the stimulus (sound level and duration of stimulation) is constant, the hearing loss can be reproduced at certain periods of time after the cessation of the acoustic stimulus, provided cumulative effects have not become apparent. However, the delay in recovery with stronger stimuli is greater than one would expect judging by the elevation of the threshold between the experiments. Latent persistent damage after strong acoustic stimuli cannot be excluded

for practical purposes because of the logarithmic course of recovery. The permanent post-traumatic hearing loss can be statistically shown to be progressive after injury by explosion. This progression is true, any source of error can be eliminated. It manifests itself unilaterally, if only one ear has been subjected to that sort of injury and affects in the first place the 4,000 cps frequency. The shape of the audiometric curve does not help to distinguish between purely traumatic and possibly endogenous etiology. The progressiveness is not influenced in any way by repeated explosions later on. It is assumed by most authors nowadays that there are individual susceptibilities of the hearing apparatus towards traumatic influences even though these variations have not been proved experimentally. It is likely that previously existing perceptive changes are in this respect more important than previous middle ear affections. For purely audiological reasons the hard of hearing person should not be subjected to acoustic injuries. The susceptibility of the individual cannot be determined according to tests mentioned in the literature as long as the relation between transient threshold deviations and permanent hearing loss has not been established. In every case of acoustic trauma one has to reckon with previously existing damage which might be difficult to assess. It is possible by animal experiments to study the actions of the two noxious influences in cats which have been conditioned and treated with streptomycin. The effect of streptomycin shows itself in the progress of recovery, whereas the hearing threshold is only slightly influenced. The pathology of hearing impairment in head injuries without demonstrable fracture of the petrous bone can be explained partly by the effect of acoustic trauma and partly by the effect on the vegetative centers, analogous of commotio cerebri. Labyrinthine affections on an anatomical basis can only occasionally be associated with accidents. The hearing disturbance after skull injury is also a progressive lesion in certain respects. In rare cases one has to reckon with impairment of hearing after injuries not affecting the skull. 298 references. (*Author's summary*)

1183. SKINNER, C. W., Jr., The rubella problem. *Amer. J. Dis. Child.*, 101(1), 1961, 78-86.

Another of the seminar reports from the University of Colorado's Department of Pediatrics. In this review of recent developments in regard to rubella, the author discusses components of the syndrome, incidence of congenital anomalies in infants of mothers who developed rubella during pregnancy, clinical findings in regard to the disease, and preventive measures to reduce possibility of congenital anomalies. It is emphasized that, in spite of immunity to rubella in the mother, the fetus may still be attacked by the rubella virus in the first trimester. 28 references. (*Rehab. Lit.*)

1184. SPECTOR, M., Positional vertigo after stapedectomy. *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 251-254.

Routine observation has indicated that many patients exhibited spontaneous nystagmus after stapedectomy. The duration varied from minutes to days; the intensity from first degree to third degree. The fast component of the nystagmus was sometimes directed to the side of the operation, sometimes to the opposite side. The intensity and duration of this spontaneous nystagmus seemed proportional to the trauma to the vestibule sustained at operation. Clinically, the types of trauma that caused most harm were pressure into the vestibule and suction. Blood in the vestibule and burring over the footplate did not instigate vertigo as much as did mechanical manipulations. (*Author's summary*)

1185. VAN DER WAAL, J., Peculiarities of noise-induced hearing loss. A study of the hearing loss of engine-room personnel. *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 208-223.

The noise in engine-rooms of seagoing vessels is relatively constant, and the time of exposure of the crews can be charted with considerable accuracy. Threshold measurements in ship crews permit a more certain evaluation of the effects of noise on hearing in a practical situation. The results of such a set of measurements are analyzed, and conclusions are drawn with respect to levels and durations of exposure.

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individual variabilities, presbycusis, and acoustic hygiene. (R.G.)

1186. WARD, P. H., and FERNANDEZ, C., The ototoxicity of kanamycin in guinea pigs. *Ann. Otol. Rhinol. Laryngol.*, 70, 1961, 132-142.

Guinea pigs given toxic quantities of kanamycin manifested general toxicity, severe ataxia or disequilibrium or both with staggering and falling. These animals had loss of hearing confirmed by marked threshold shifts in cochlear microphonics and action potentials. The patterns of histopathological changes in all specimens of the toxic animals were similar. There was severe damage to the outer hair cells and supporting cells with relative sparing of the inner hair cells. The vestibular receptors were considered normal. One specimen had diminution in the VIII nerve fibers and ganglion cells. Three of the toxic animals showed patchy, disseminated, rarified areas primarily involving the granular layers of the cerebellum. Spotty, light staining areas believed to indicate degeneration of ground substance with preservation of cellular structure were present in the brain stem. (Authors' summary)

1187. ZELIG, S., Syndrome of Waardenburg with deafness. *Laryngoscope*, 71, 1961, 19-23.

A family is described in which only some components of the total Waardenburg syndrome appear. The primary subject is a four-year-old totally deaf boy who also gave no vestibular responses to caloric or rotatory stimulation. His eyes were set "wide apart with eyelids closed on the proximal sclera and the lacrimal gland point above the iris; wide root of the nose with very wide eyebrows; blue pale irises dotted with black points. A white lock of hair on the forehead and a patch of white hair on the right arm were found." A three-year-old brother had only eyelid abnormalities. A six-month-old sister had eyelid abnormalities, a wide interocular region, and several white hairs on her forehead. Hearing tests on her were inconclusive. The 24-year-old mother had the eyelid abnormality, one blue iris and one dark brown, and a profound unilateral sensory-neural hearing impairment. Her hair had turned gray several years ago. The

father showed none of the characteristics of the syndrome. (R.G.)

HEARING AIDS

1188. WRIGHT, H. N., and CARHART, R., The efficiency of binaural listening among the hearing-impaired. *A.M.A. Arch. Otolaryngol.*, 72, 1960, 109-117.

A group of subjects with bilateral hearing losses were tested with monaural diotic (Y-cord), and binaural hearing aids. Spondee thresholds and discrimination scores for PB words were obtained with each type of hearing aid system, both in quiet and in the presence of sawtooth noise. Monaural performance was assessed half the time with the hearing aid ipsilateral to the speech source and the other half of the time with the hearing aid contralateral to the speech source. Noise, when used, always came from the side opposite the speech source. Some subjects had difficulty achieving the experience of binaural fusion while wearing two hearing aids. Performance on the task of specifying a comfortable level for aided listening was similar from one condition to another and subjects were relatively consistent in re-selecting the same level. The main findings are (a) Performance with the diotic (Y-cord) system was equivalent to performance with the monaural system. (b) Comparison of differences between the spondee threshold during monaural and binaural hearing aid use revealed three effects: the binaural effect, the noise effect, and the sidedness effect. That is, binaural thresholds tended to be better than monaural, and this advantage was enhanced both by the introduction of competing noise and by having the speech source contralateral to the monaural hearing aid. (c) Comparison of analogous differences between discrimination scores for PB words also revealed the binaural effect, the noise effect, and the sidedness effect. Two clinical implications seem justifiable from the observation that superiority with the binaural hearing aid system appears only under some circumstances and only by some subjects. First, the procedures of hearing aid evaluation should be chosen so as to emphasize rather than to obscure differences between binaural and monaural instruments. Second, the patients who achieve advan-

tage from a binaural system when so evaluated will probably find added benefit from this type of system to the extent that they must do their everyday listening in adverse acoustical conditions. (*Authors' summary*)

LANGUAGE AND COMMUNICATION

1189. FROHN, W., *Zum Problemkreis "Wortschatzsammlung."* (Problems in building vocabulary.) *Neue Bl. Taubst.*, 14, 1960, 23-27.

Building vocabulary cannot be separated from the method of language teaching used. Older methods of teaching deaf children used a smaller vocabulary in the primary department, and left it to the intermediate classes to extend it. The small vocabulary used in sentence-structure exercises was derived from the cultured language and was used to teach abstract meanings in the higher grades. In a later period language teaching showed characteristics of relating spoken and sign language with the visual, concrete, specialized features of the latter. Language was built in a mosaic-like way; formal exercise was considered superfluous. Vocabulary was built in a different way; it grew in extension, but not in higher level abstraction and relational word meaning, so typical for educated language usage. This educated language was not the basis for instruction, but rather the language needs of the child. Yet, the latter should be seen in relation to the first. Conclusions from these oppositional approaches are (a) there should not be an opposition between material (vocabulary) and structure (method) in teaching language to the deaf; (b) the need of the deaf child for vocabulary with which to meet the hearing world is not an absolute entity, but is relative to his versatility in language usage; (c) experiencing vocabulary and language is similar for deaf and hearing persons; (d) the cultured language, being the final object of teaching, should once again be made the focus of attention, although its content should not be determined in an oversimplified way by mere statistics. The cultured language should be the basis for building vocabulary according to the child's need. Neither mosaic-type language development nor randomized ex-

tension of concrete vocabulary can serve this purpose. (*B.Th.T.*)

1190. JONES, K., *Communication scales.* *Volta Rev.*, 63, 1961, 72-77, 94.

This paper presents three broad factors of expectations of communication scales for the child with a hearing loss greater than 65 db. The author suggests four guides for the development of language growth: development of language structure, increase of vocabulary based on the child's individual experiences, increase of vocabulary through group experiences of the class, and the creation of situations by the teacher for language not within their experiences. She points out that learning of language principles and grammatical forms should be expanded steadily through the school years. She feels the use of the Fitzgerald key or a similar device is invaluable in assisting children in getting straight language and understanding sentence construction. She emphasizes the need for steady growth in correct use of language can only be assured by continued stress on the mastering of new vocabulary, on verbal forms, and idiomatic expressions. She feels that this final goal is especially necessary for the deaf individual in a hearing world. Speechreading is the basis for the development of good communication; and, while there are good speechreaders and poor speechreaders, most children need a great deal of training in this skill throughout their school careers. Regarding speech teaching she writes that, while there is a need for developing speech through the word method, the time must come for the children to learn individual sounds so that they can correct some of their own speech and learn to articulate new words. At a later date diacritical markings must be taught to enable the children to succeed in the upper grades. She then discusses reading as another communications skill. She describes a sequence for the development of reading, and she emphasizes that the deaf child seems to learn to read for information more easily than he learns to read for pleasure. She concludes with a discussion of the need for more and better trained teachers. New processes must be developed in order to recruit and educate teachers by means of summer courses and in-service training. (*J.B.M.*)

1191. KOMAROV, K. B., *Rabota nad narechiyami i slovami kategorii sostoyaniya v mladshikh klassakh shkoly glukhonemykh.* (Work in younger classes of a deaf school on adverbs and words denoting a state.) *Spetsial'naya Shkola*, 97, 1960, 11-20.

By practical lessons in mastering the system of the Russian language with extensive and varied grammatical material, pupils are made to use combinations of words and sentences with adverbs and words denoting state or condition; e.g., he went *upstairs*; it is *stifling* in the room. These present definite difficulties, as young pupils often (a) replace impersonal constructions by a personal sentence (b) leave out the verb (c) replace adverbs of direction (where to?) by adverbs of place (where?) (d) mix up verbs and adverbs. Methods of imparting the meaning of such words should be connected with the activities of the pupil at school or play by introducing a new adverb into the speech at the moment the need for it is felt; e.g., the carrying out of orders and instructions ("Stand in front of Vera; sit beside Galya, etc."). In addition, concrete examples should be used to demonstrate the concepts of near-far, up-down, etc. Because adverbs in Russian are not declined or conjugated, their use presents less difficulty for deaf and dumb children than nouns or verbs. The guiding principle for the correct use of adverbs of place and manner is to use them with expressions connected with activity ("Go to the right, stand on the left."). Apart from the use of adverbs in colloquial speech, they are widely used in descriptive and narrative speech, in descriptions of objects, natural phenomena and actions. Exercises in picking out adverbs in a series of words are useful, because morphologically many adverbs are correlative with other words, which can lead to mistakes. To form the habit of combining adverbs of place and manner with definite verbs, suitable exercises with models of word combinations are needed. The similarity in meaning and morphological structure of adverbs of place (where?) and direction (where to? whither?) is the cause of some confusion in the speech of deaf school children, and exercises with different verbs of state and rest and verbs of motion will help to

prevent such mistakes. Words denoting state or condition can be divided into three groups expressing (a) states of nature, environment, location (cloudy, warm), (b) physical or mental state of person or animal (ill, gay) and (c) assessment of any state (ugly, difficult). Their abstract character makes it difficult for younger pupils to discover their meanings, especially as deaf children only make feeble use of verbal speech to express their emotions and experiences. This can be overcome if such words are connected with direct observation of nature, with the activities and feelings of the children, with the carrying-out of orders, and if they are always used when the need for them arises. Exercises on descriptions of pictures, natural phenomena, talks on natural history subjects can also be of assistance here. Though they are invariable, the essential grammatical sign of words denoting a state is that they are the nominal part of the predicate in an impersonal sentence and are combined with a *copula* (it *was* warm). To avoid the tendency to use such words with personal verbs, it is essential to make constant use of a special table, complete with link-verbs and groups of words denoting state and also adverbial phrases with prepositions. (H.G.W.)

1192. MILLER, J., *Speech in the pre-school child.* *Volta Rev.*, 62, 1960, 315-317.

The paper discusses a speech program for the deaf preschool child. It involves creating an atmosphere in the classroom, home, dormitory, and playground that is conducive to good oral communication, setting goals for each child that are possible for him to achieve, and pouring in as much language as possible. This language should be the kind the children would like to have in order to express themselves. The author urges the teacher to develop as good voice quality as possible (this involves listening for natural voice placement). Take advantage of the articulation that the children use in their babbling. Start from the beginning the use of two-syllable words to develop correct pronunciation, making sure to give the proper value to each word. Work toward a rhythmic pattern and work to see that this pattern is as close to the rhythm pattern of English-speaking people as possible. And

last, but not least, develop the kind of speech that persons outside of the family and the classroom can understand when it is used in meaningful situations. (*J.B.M.*)

1193. MOSER, H. M., O'NEILL, J. J., OYER, H. J., ABERNATHY, E. A., and SHOWE, B. M., Jr., Distance and fingerspelling. *J. speech hearing Res.*, 4, 1961, 61-71.

A test was made of the visual intelligibility of nonmeaningful alphabet triplets presented in fingerspelling to 24 deaf students under conditions of artificial lighting and natural lighting. Two senders, familiar with the fingerspelling alphabet and known by the subjects presented the materials. Results indicated that distance between the sender and the receivers was the prime factor affecting intelligibility. At 125 feet, the greatest distance tested with the entire group, the average intelligibility was 87.6%. At 250 feet, the five best readers were able to recognize better than 50% of the materials. Outdoors the average per cent intelligibility was higher than for the corresponding distance indoors and the average intelligibility was above 50% at 300 feet. Under all conditions of testing there were tendencies for certain letters to receive certain substitutions and other letters to be highly confused with a wide variety of letters. Substitutions tended to follow gross hand shape. In general, the intelligibility of alphabet letters was sufficiently high up to 175 feet to indicate possibilities of using the fingerspelling alphabet as a means of supplementing or clarifying present hand signals now in use. (*Authors' summary*)

1194. OYER, H. J., Teaching lipreading by television. *Volta Rev.*, 63, 1961, 131-132, 141.

The purpose of this study was to determine whether significant improvement in lipreading test scores was attained when lipreading lessons were presented by way of closed circuit television. The subjects consisted of 32 normal hearing individuals in a speechreading class which met five days a week, two of which were devoted to presentation of televised lipreading lessons by a member of the class. The subjects were pretested with a filmed test of lipreading consisting of 100 monosyllabic

words, spoken by four speakers. At the close of the 10-week period the same test was readministered. Analysis of the results showed that a mean score of 28.7 was received on the pretest and a mean score of 39.1 on the post-test. It is concluded that lipreading can be taught by using the television medium but that one could not generalize these findings to say that this type of two-dimensional teaching will help a person to be more skilled in face-to-face situations. It was noted that throughout the television training sessions the interest level of the students appeared to be high. (*J.B.M.*)

1195. ROSENSTEIN, J., Perception, cognition and language in deaf children. *Except. Child.*, 27, 1961, 276-284.

In this critical analysis and review of the literature, based in part on the author's doctoral dissertation, Dr. Rosenstein notes the lack of agreement among investigators dealing with perceptual and conceptual abilities in the deaf. Pertinent definitions and concepts are examined briefly before analysis of the literature is attempted. Studies concerned with intelligence in deaf children, perceptual and conceptual organization, sorting behavior, visual memory, rigidity and perseveration, and abstract reasoning are discussed in some detail. Opinions and findings on the relation between language and thought, taken from the fields of psycholinguistics and psychology, suggest a close involvement. Conditions may exist, however, in which thought is carried on without verbal or linguistic behavior. A recent study by the author found no differences in conceptual performance between groups of deaf and hearing children; however, linguistic factors were within the language experience of the sample of deaf children. Findings have implications for the educational methods used in developing ability in deaf children to conceptualize. 59 references. (*Rehab. Lit.*)

1196. SHERIDAN, M., LIVINGSTONE, G., REED, M., and GALBRAITH, W., Discussion on hearing and speech defects in childhood. *Proc. roy. Soc. Med.*, 53, 1960, 781-783.

Four people discuss various aspects of childhood problems. Mary Sheridan states

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that the three most frequent causes of failure or delay in the development of spoken language are (a) lack of adequate opportunity to learn in the first few years of life, (b) impaired hearing, (c) mental backwardness. She states further that problems of cerebral dysfunction in relation to disorders of speech and language in childhood are many, serious and need further investigation in terms of pediatric neurology.

Gavin Livingstone claims that most so-called deaf babies have some residual hearing which if trained early enough will enable the child to have his best chance of learning speech. He reports on the number of cases of perceptive deafness attending the Radcliffe Infirmary, Oxford, during the last three years as follows: 58 under five years and 50 from five to 15 years. 10 cases of bilateral, congenital atresia in children under 10 years of age are also noted. Of these 118 cases 47% are thought to have prenatal causes, 14% neonatal, 6% postnatal and 33% unknown.

Michael Reed states that from a mental age of three years there is usually no difficulty in establishing a reasonably accurate assessment of hearing. He discusses further the areas of behavior, response to sounds, mental retardation and hyperactive or withdrawn children. He points out, in conclusion, that nonverbal pictorial items may demand full speech comprehension for their full significance to be realized.

W. Galbraith presents the teacher's point of view in working outside the established special school system. She states that no rehabilitation can be adequately undertaken without full details of the child's hearing loss, intelligence, social background and medical history. She discusses particular problems occurring at certain ages; namely, under two years, 2 to 5 years, 5 to 11 years and 11 years and over. She also discusses the doubly handicapped child. Her final conclusion is that the key to success of all training of acoustically handicapped children lies in the training of the parents. (M.N.)

1197. TITOVA, M. F., Osobennosti usvoeniya proiznosheniya slova u glukhikh detei, nachinayushchikh obuchenie rechi s daktil'noi formy. (Peculiarities in mastering

pronunciation amongst deaf children who are beginning to learn speech through dactylic language.) *Spetsial'naya Shkola*, 97, 1960, 20-28.

Dactylic language has been found to be the most suitable basis for the formation of speech and pronunciation. In the initial stage dactylic language develops much more rapidly than oral speech, and the process of lipreading is supplemented by reading the same material from the teacher's finger-spelling. Continual use of both forms simultaneously leads to the creation of a single functional system uniting both finger and mouth movements. With the establishment of a reliable correlation between the two forms of speech, dactylic language begins to emerge as a subsidiary controlling means to oral speech. This article aims at giving the characteristic peculiarities which occur in the process of mastering the articulation of a word being formed by dactylic language and oral speech. Mastery of pronunciation is achieved by continual direct imitation of the teacher's speech in school and play activities and special training in the articulation of a word and its elements. But the mastery of dactylic language occurs only by imitating the movements of the teacher, who, when using finger spelling, should unfailingly accompany it by uttering the same speech material aloud. The pupil's speaking, accompanying his dactylic language, is guided by imitation of the teacher's articulation, seen or grasped by touch-vibratory sensations. The teacher must always encourage and develop the pupil's pronunciation of all spoken material. An experiment was made with two pupils on the formation of the pronunciation of two words: *Karandash* (= pencil). This word, complicated in its sound-syllabic structure, literally appeared in the pupils' speech from the first days of instruction. By the end of the year, it was still unpronounceable, but by replacing *r* by *l*, and *d* by *t*, it could be produced fully even by the second term. *Yabloko* (= apple). This appeared early and fairly often. A trisyllabic word with the first syllable containing the diphthong "ya," and the second the confluence of two consonants. According to the special pronunciation training plan, this word is not pronounceable until the follow-

ing year, but if *ya* is replaced by *a* and *b* by *p*, then it is pronounceable by the end of the second term. *Conclusions from experiment:*

(a) Mastery of words in dactylic language is accomplished much earlier than in oral form. The image of the word in dactylic language serves as a support and outline which predetermines the mastery of a definite sequence of sounds for each word.

(b) The process of forming the vocal structure of a word was very much the same with all pupils. The single mouth-moving and finger-moving stereotypes of the word are soon fixed in the pupils' consciousness as the result of continual pronunciation plus fingerspelling of the material by the teacher, and after him by the pupils. This conception of the word as a single dynamic stereotype stimulates reproduction of the full vocal structure of the word, resulting in a whole series of substitutes approximately reproducing the sounds appearing in all pupils. There were difficulties over the presence of related endings in the reproduction of sound-syllabic structure of words (common to all pupils). There were some cases of regressive assimilation. There were frequent cases of one consonant being omitted, when two came together. An extra sound was sometimes included, thus increasing the number of syllables. *Five Stages in general process of formation of words appearing in pupils' speech from the first days* (at first, only in dactylic language).

(a) Elementary stage occupying a very short time. The pupil only makes attempts to articulate all the words with strained position of speech organs, not corresponding to change in finger signs. The first models of articulation are taken by direct imitation from the teacher. The overcoming of the following difficulties has great significance in the process of mastering the pronunciation of the word: he must master the technique of dactylic language, and he must grasp the presence of the articulatory definiteness characteristic of each word which forms the constancy of its sound construction. This ensures the formation of phonetic conceptions in images of words. Already a big share falls on dactylic language as a means of explaining the phonetic structure of words with comprehension of oral speech by lipreading. (b) This stage is characterized by a fairly

clear syllabic structure of the word, made up of sounds, corresponding to the number of syllables in the word. Both stages can generally be placed in the first school term. Mutual correlation of dactylic language and oral speech is weak. As a large number of words have just entered the children's speech, efforts are mainly directed to sign reproduction of the structure of the word, so the pronunciation of speech material is often below their real articulatory possibilities. (c) The two forms of speech continually used together are now correlated in a single system of conditioned reflexes in the upper section of the CNS. This stimulates the appearance of substitutes for nonexistent articulations. Approximate limit to this occurrence is middle of second term. (d) At this stage the word is pronounced with its full vocal structure, sometimes fully and exactly and sometimes fully and approximately. (e) This stage shows full reproduction of sound-syllabic structure with exact (or approximate) pronunciation of sounds by the end of the first year of instruction. The degree of automatization of articulatory habits remains low up to the end of the year, as is shown by instability in vowel structure and mistakes in reproduction of order of sounds in all pupils. By the end of the year, however, words are generally pronounced in full. The teacher's task is to help the pupil to acquire as soon as possible, instead of a haphazard articulation, a substitute for it, which can later help the working-out of an exact pronunciation. At different stages he will notice different articulations of words by pupils. He should control the pronunciation of a word, either fully, with its exact vocal structure, or fully, but with an approximate pronunciation of the sounds, or not fully, owing to the omission of separate sounds, a syllable or any combination of sounds, and instill in the children the habit of pronouncing all speech material. By following this course, he can make his pupils' oral speech richer and more active, so that it can be used fairly soon as a means of communication with people of normal hearing. (H.G.W.)

MULTIPLE HANDICAPS

1198. ANON., White House conference on aging. *Geriatrics*, 16(3), 1961, 111-152.

Final reports from 20 sections includes a report on Rehabilitation, Section 6. This report urges greater public concern for the problems of the hard of hearing and the deaf, a system for case-finding, the training of personnel, providing of hearing aids, special plans for job-placement, and incorporation of safety provisions for persons with hearing loss in housing planning. Inadequate communication is cited as one reason for millions of older people being dependent on others in daily living. (J.C.S.)

1199. QUIBELL, E. P., STEPHEN, E., and WHATLEY, E., A survey of a group of children with mental and physical handicaps treated in an orthopaedic hospital. *Arch. Dis. Childh.*, 36(185), 1961, 58-64.

Of 40 children 2-16 years old with physical (30 cerebral palsy, 7 spina bifida with myelomeningocele) and mental (an I.Q. of 70 or less) handicaps, 36 children had, on the average, two additional handicaps: vision, hearing, speech, epilepsy, and GU problems. These children were evaluated as to degree of functional independence in daily living, ranging from functional independence to making no worthwhile progress in required ward placement. After treatments (in PT, OT, speech therapy, drugs, surgery, plaster, and remedial reading, and providing appliances, including hearing aids), 31 children showed demonstrable gains in functional independence. "It appears that the minimum I.Q. or mental age necessary in order to make useful progress in daily living function is much lower than may have been assumed." Imbeciles, but probably not idiots, may improve in function. (J.C.S.)

PSYCHOLOGICAL FACTORS

1200. BAILEY, H. A. T., Jr., and MARTIN, F. N., Non-organic hearing loss. *Laryngoscope*, 71, 1961, 209-210.

The 16-year-old son of congenitally deaf parents sought admission to a state school for the deaf. Otologic examination was normal, audiometric responses were spurious, and the Doerfler-Stewart test was positive. Clinical findings and audiometric observations indicated normal hearing. During an interview the boy revealed anxiety over going to school with hearing children.

After a recommendation that he receive psychiatric study and guidance, the boy retreated further into "deafness" by using manual communication and decreasing his use of speech. (R.G.)

1201. CARR, J., The teacher's role in promoting mental health. *Volta Rev.*, 63, 1961, 65-69, 89.

In discussing the mental health of the acoustically handicapped child, the author centers her remarks around these premises: (a) the factors which influence the mental health of the acoustically handicapped child are, in the main, little different from those which influence the mental health of any child; (b) the classroom teacher exerts the most powerful influence upon the mental health of the child during the hours he is in school, and (c) mental health is an extremely personal, individual matter, and the factors which bring it about vary from person to person. The author points out that the greatest responsibility of the teacher is to see first the whole child, then the teacher can consider the child's hearing impairment and the effect it may have upon the satisfaction of his needs. The teacher must obtain as complete a picture as possible of the child in order to understand what sort of person the child is and why the child is the sort of person he is. In order to do this, the teacher calls upon the supervisor, the psychologist, the social worker and the parents for information to complete the picture of the child. With this information about each child and an understanding of the child's needs, the teacher is better able to create and maintain a classroom atmosphere that is healthy for all concerned. (Author's summary)

1202.—FARLEY, J. C., DERBYSHIRE, A. J., AUSTIN, D. F., WALDROP, W. W., CARTER, R. L., McCORMICK, C., and MILLS, P. J., Psychic factors in hearing loss. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 731-746.

A pilot study illustrates the design, and suggests working hypotheses for a research aimed at specifying the psychic factors which may predispose, cause, or contribute to inefficiency in the use of (organically) available auditory information, at any point in the hearing act. . . . Definitions, and

theories relating those definitions, are offered, and a rationale and procedure for the testing of these theoretical formulations is demonstrated on a preliminary group of seven patients, in whom a substantial psychic component has been suspected. . . . (*Authors' summary*)

1203. GREEN, P., "..... education?" *Teach. Deaf*, 59, 1961, 49-54.

A study of mental abilities, reading ages, speech intelligibility, and preferred method of communication of 60 deaf and partially deaf boys from ages 16 to 20 attending the Manchester Trade Training School during the 1958-59 school year is described. Raven's Progressive Matrices to measure reasoning abilities, Gates Vocabulary Tests, Schonell's Silent Reading Tests, and a two-way conversation to rate speech intelligibility are used. Results indicate that the average reading age is 9.0 years and vocabulary age is 10.0 for students with a CA of 16.8. 28% are rated as having intelligible speech. Mental abilities, as measured by the Raven's Matrices, classify 31% in Groups I and II, 53% in Group III and 13% in Groups IV and V. Boys who consistently prefer signing are the most illiterate and of poor intelligence. (*M.S.K.*)

1204. LEMKAU, P. V., The influence of handicapping conditions on child development. *Children*, 8, 1961, 43-47.

A discussion is given related to possible differences that may occur in a child's total personality when there is an imbalanced input from the senses. Hearing and speech problems are mentioned in relation to faulty sensory input. Some effects of total deprivation of stimulus on animals and humans are reported. The idea that some handicapped children respond to lack of stimulation by becoming useless or by dying is derived from observation of the same type of reactions in sensory organs when these receptive organs are deprived of stimulation. Unbalanced stimulation, either a lack of or an overabundance of stimulation from a given sense or the senses is discussed in terms of integration of these impulses by the brain, proprioceptive impulses, and the possible effects of abnormal input on personality. The effects of time are considered. The usual conclusion is that the earlier in life the disability

appears the less likely it is to disturb personality functioning. Early or congenital loss of hearing is an exception. Absence of input of hearing signals to the brain during the critical period for language formation leaves a damaged capacity for learning communication skills. For handicapped children the maximal use of normal channels of input should be made. (*N.J.C.*)

1205. MENDELSON, J. H., and SINGER, L., and SOLOMON, P., *Psychiatric observations on congenital and acquired deafness: symbolic and perceptual processes in dreams.* *Amer. J. Psychiat.*, 116, 1960, 883-888.

26 deaf college students were interviewed in the language of signs and manual alphabet to obtain information concerning the symbolic and perceptual processes experienced in their dreams. It was found that the dreams of the congenitally deaf were vivid, brilliantly colored, and reported as frequent in occurrence. Usually the language of signs was the means of communication in the dream, but in dreams in which affect was prominent, primitive signs were often utilized. The characteristic differences in the dreams of the deaf were most marked in the congenitally deaf, less marked in those with acquired deafness before age five, and least marked in those with acquired deafness after age five. The relevance of these findings to super-ego formation, nonverbal communication processes, and recent observations in experimental sensory deprivation is discussed. (*Authors' summary*)

1206. MENDELSON, J. H., SINGER, L., and SOLOMON, P., *The effects of chronic sensory deprivation on language and comprehension.* In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XVIII, 14.

Experimental sensory deprivation has been employed as a new technique in behavioral science research during the past decade. The use of this technique was suggested by numerous literary, autobiographical and clinical reports of individual reactions to sensory deprivation, isolation and monotony. One of the most common forms of chronic sensory deprivation reported upon was congenital and early ac-

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quired deafness, and usually the result of such deprivation was the impairment of adequate communication via speech. We have studied deaf college students who employ the language of signs and the manual alphabet as their principal mode of communication. The major hypothesis of this study was that an individual suffering from chronic deafness and thus deprived of the normal auditory and verbal processes of communication would incorporate any necessary modification of such communication into cognitive processes, fantasy behavior and dreams. 26 adult male college students with a hearing loss of 80 db or greater bilaterally were the subjects of this study. Three categories of subjects were investigated: congenitally deaf, acquired deafness prior to age five, and acquired deafness after age five. All subjects received semi-structured interviews conducted in the language of signs and with the use of the manual alphabet. The findings indicated that almost all subjects employed sign language symbolism in their conceptual and abstract thinking. Since the number of formal signs is quite limited (about 5,000) a deficit in concept formation and abstraction might be expected to occur. However, small gestural modifications and variations of intensity of facial expression during signing produce many new signs not classified in formal handbooks and endow the language of signs with a true vocabulary in echelon. In addition to the orthodox language of signs modified by colloquial expressions as employed in abstract thinking and normal communication processes, a second and unique characteristic appeared in the language symbolism of fantasy behavior and dreams of the deaf. This consisted of "primitive signs," gestural communication employed by parents or parental figures in early childhood before the standard language of signs was learned. Such gestures usually conveyed strong affective qualities such as anger, disapproval, warning, fear, and occasionally approval and praise. The significance of the relationship between the frequency of appearance and characteristics of primitive signs in fantasy behavior and dreams to the age of onset of auditory deprivation will be discussed. The value of studying a deaf population in order

to help elucidate some relationships between nonverbal communication processes and certain aspects of behavior will also be discussed. (*Authors' summary*)

1207. SEIFERT, K. H., *Der Progressive-Matrices Test und seine Ammendung bei taubstummen Kindern.* (The Progressive Matrices Test and its application to deaf mute children.) *Neue Bl. Taubs.*, 14, 1960, 16-22.

Following Raven's directions, the author has administered the Progressive Matrices test to 150 deaf students between eight and 16 years. He reports highly satisfactory results. However, the extensive verbal instruction should be simplified for obvious reasons. Also, the deaf subjects should be given more encouragement during the procedure. (*B.Th.T.*)

SOCIAL AND LEGAL FACTORS

1208. NATIONAL COLLEGE OF TEACHERS OF THE DEAF, *Social problems of adolescence.* *Teach. Deaf*, 59, 1961, 25-28.

One-day conference on social adjustment of adolescent deaf is reported. Psychological factors in parent-teacher relationships, emotional changes, sex education, bridging the home-school gap, and communication barriers are discussed. (*M.S.K.*)

1209. PARTIN, K. W., *A parent speaks.* *Volta Rev.*, 62, 1960, 421-423.

The author states that a deaf child needs frequent contact with hearing companions of his age level during the formative years. He needs exposure to everyday language used by his hearing peers. He needs his confidence strengthened by making himself understood by his young companions, not waiting until graduation from a deaf school before being tossed into a hearing world to sink or swim. By removing the iron curtain separating him from the opposite sex and from normal hearing companions he is less likely to develop such types of undesirable behavior, both social and psychological, which are often attributed to the deaf; e.g., rigidity of personality, suspiciousness, bluffing, chronic depression, shyness, reticence, or restlessness. He states that it is far better to integrate him into a hearing society during his formative years,

thus sharpening his lipreading of everyday language and thereby strengthening his self-confidence. (J.B.M.)

VOCATIONAL TRAINING AND ADJUSTMENT

1210. ENGELMANN, K., MÜLLER, W., WENNING, U., SCHAAF, K., WIECHMANN, W., GERIGK, A., HEUGEL, A., GRUNER, M., and SCHERZER, L., *Der gegen wärtige Stand des Gehörlosen-Berufschulwesens in der Bundesrepublik*. (The present situation of the vocational school system for the deaf in the federal republic [of Western Germany]). *Neue Bl. Taubs.*, 14, 1960, 76-94.

Report of nine papers given at the convention of Friedberg, February 28, 1959. K. Engelmann ("Survey," 76-78) states that vocational training is part of total education. Although teaching oral language broadened vocational possibilities, it also has led to problems in advanced vocational training: work skills of the deaf vs the job opportunities the nation offers them; demands upon the teacher to be both a skilled craftsman and an experienced teacher of the deaf; necessity of teaching the deaf child both the skills and the language of his trade; limited course offerings in some schools and limited facilities for training teachers for the courses offered. Responses to attempts for a nation-wide organization have been poor; the schools of Southern Germany remain with their own vocational program, thus limiting their students to choose from a few possibilities. They have tried to make up for it, however, by intensive training.

W. Müller ("The central vocational school for the deaf in Dortmund," 78-83) reports that it has 140 students and teaches 12 trades, of which only in metal craft can the students be graded. This type of central school for a certain area seems a better solution than one federal school, as the latter would lose the valuable contact with the local industries and the master system. The mastermate system, in which the deaf mate does not live at the school but at home, seems better than the too protective vocational training shop. One disadvantage of the latter is that the more gifted suffer from the overprotection of the slow learners. The school teaches two four-week courses of 36 hours a week every year. The examinations are taken on equal basis with

the hearing, but the teachers are present for interpreting. Prerequisite for a central vocational school is a large city with extensive industry, trade, organized labor, and a complete school system.

U. Wenning ("The central vocational school for the deaf in Dortmund [abbreviated]," 83-84). The advantages of this new school are, among others, that more specialized classes can be started for more students from a larger area. Among the disadvantages of discontinuing the vocational shops are the facts that the new eight-week course provides too much free time the rest of the year and the two four-week courses are crammed; that the students, while working as mates, lack the support of the teachers and are apt to forget subject matter; that the work done on the required test work cannot be supervised by the teachers. Schmähl discusses this paper: it is too early to point out the disadvantages; there should be a distinction between those problems that can be solved and those that cannot. Some problems mentioned were experienced before.

K. Schaaf ("The matter of vocational schooling in Hessen," 84-86). The present situation in the state of Hessen is unsatisfactory, as there is only one afternoon a week general theoretical training available. The solution sought is a school in Frankfurt, a large, central town. The students ought to be day students, insofar as possible, who follow either an eight-week or two four-week courses, and work under the free mastermate system. The future might bring more specialized, central vocational schools in Germany, adapted to the regional crafts and industries.

W. Wiechmann ("The vocational school for the deaf in Essen," 86-88). 75 day students are divided over seven classes; differentiation according to the many occupations is difficult; centralization, which is in discussion, will be welcomed as a necessity. Two fundamentals for the future of vocational training are (a) contact between school and industry and the Commerce Department to arrive at a satisfactory technical language and vocabulary, so as to supply the student with the language essential to his examinations and his trade and (b) the same type of contact for vocational teachers in training to give them an insight into their many-sided profession. These teachers

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should not be part-time, grade school teachers.

A. Gerigk ("The Rhineland vocational school for the deaf in Kempen [NDRH]," 88-90) states that the aim of any vocational school, either for hearing or for deaf students, is the same. Yet the deaf suffer the handicap of language incapacity after eight years of grade school training and, therefore, have study problems. Solution ought to be in outlining the minimal subject matter as presupposed by the vocational school, omitting everything unnecessary. The vocational school should not be a department of a regular school, but a centrally-located, independent day school. The teachers have to be trained teachers of the deaf and, preferably, professional craftsmen or, at least, teachers of the deaf with sufficient vocational training.

A. Heugel ("The organization of the school system of vocational schools for the deaf in Northern Baden [summarized]," 90-92) reports that in Northern Baden there are mostly day schools; however, two dormitories are available for students who work in the town. There are three possible types of organization: (a) apprenticeships for students in the free master-type education, (b) study in the vocational training shop, or (c) short courses of a few weeks each year. Northern Baden has type (a). The teachers rewrite the textbooks which are too difficult. At the examinations they serve merely as interpreters. Contact between school and crafts-master is necessary. Full-time teachers become vocational teachers of the deaf by either training a year on a vocational subject or, if they have the vocational skill, a year on teaching the deaf.

M. Gruner ("Pan-linen"-care at Winnenden [vocational trade school for the deaf, with vocational shops]," 92) states that the school gives a 3½ year course for boarders who also work outside, the latter enabling them to train in the free master-type training. The 35 year history is satisfactory; permanent teacher assistance is available for the weaker student, and there is better moral protection for these young people.

L. Scherzer ("Summary," 93-94) reports that deaf students for vocational schools are relatively few and scattered throughout the country: possible vocational professions are relatively plentiful. A solution for suitable

vocational training should be sought for on a larger, statewide scale. The deaf are by law equally entitled to professional schooling with grading in study-years. The central schools in heavily populated areas, eventually specified by the type of local industry, look like the solution. The old discussion between apprenticeship training and vocational shop should be forgotten for the more important aim: the satisfactory education, as required by law. (*B.Th.T.*)

SPEECH

ACOUSTICS

1211. ALEXANDER, A. A., GRYB, R. M., and NAST, D. W., Capabilities of the telephone network for data transmission. *Bell Syst. Tech. J.*, 39, 1960, 431-476.

This paper presents the results of a nationwide data transmission field testing program on the telephone switched message network. Error performance using the FM digital subset is described and basic transmission characteristics such as net loss, band width, envelope delay and noise are given. The evaluation program has demonstrated that speeds as high as 1200 bits per second with an FM modem using a zero-crossing detection system are entirely practicable on the regular switched telephone network. In many cases, the probability of error in transmission may be so much lower than the probability of error from other sources that error control may not be necessary. It is possible to design around many of the data limiting characteristics of the network—the companders and echo suppressors, for example. For some applications, arrangements may be made to bypass certain facilities that limit the transmission of data signals. These may take the form of controlled access to the long distance switching network or perhaps the use of only certain telephone facilities and offices in the data service offering. (*E.D.S.*)

1212. KIRIKAE, I., SATO, T., OSHIMA, H., and HIROSE, H., An experimental study on hearing of one's own voice. *Pract. Oto-Rhino-Laryngol.*, 23(1), 1961, 56-71.

The hearing of one's own voice was investigated to verify the relationship between its air and bone conduction elements using the loudness balance and beat methods. The results obtained were as follows: (a) There

was a considerable difference in loudness between the hearing of one's own voice itself and its bone conduction element in the vowels "A" and "E," while in "I," "U" and "O" the difference was proved to be much smaller. (b) When the tympanic membrane was loaded with a metal block, the hearing of one's own voice in the vowels "A" and "E," showed only a little change in loudness in spite of a considerable increase in the proportion of the bone conduction element. On the contrary, increase in the loudness of hearing one's own voice and in the proportion of the bone conduction element were both noticed in "I," "U" and "O." (c) According to the results obtained by means of the model experiment, the mechanism of hearing of one's own voice could be explained, namely, it should be reasonable to conclude that the air conduction element plays a principal role in the hearing of one's own voice in the vowels "A" and "E," while the bone conduction element does in the vowels "I," "U" and "O." (d) In the experiment on the five nasalized vowels, almost the same results were obtained concerning the change in loudness, as were observed in the loading experiment. This change might be caused by intervention through resonance in the nasal cavity. (e) Both the hearing of one's own voice and its bone conduction element were about 15 db louder in the head voice than in the chest voice. (*Authors' summary*)

1213. PETERSON, G. E., Parameters of vowel quality. *J. speech hearing Res.*, 4, 1961, 11-29.

This study is concerned with the various acoustical parameters involved in vowel production and perception. Most of the data presented are based on analyses of sustained vowels which were matched to a set of reference vowels by various speakers in an anechoic chamber. Formant amplitudes, fundamental voice frequency, and phonetic environment are considered, in addition to formant frequencies, as factors which influence listener judgments of sustained vowels. A pattern-experience theory of vowel perception is suggested in which the ratios of formant frequencies may be considered to control judged vowel quality only within the normal limits of parameter magnitudes and the phonetic frame in-

volved. Problems for future research on vowels are indicated. (*Author's summary*)

ANATOMY AND PHYSIOLOGY

1214. DEY, F. L., and KIRCHNER, J. A., The upper esophageal sphincter after laryngectomy. *Laryngoscope*, 71, 1961, 99-115.

The normal sphincter closure of the upper end of the esophagus is usually absent after laryngectomy. In spite of this there is no difficulty in swallowing nor is air sucked into the esophagus on ordinary or even deep inspiration. The prevention of esophageal respiration is not an important function of the upper sphincter mechanism. Esophageal speech does not depend upon a functioning sphincter at the upper end of the esophagus. Our best speaker had no demonstrable sphincter and could speak on both inspiration and expiration. The peristaltic activity of the lower esophagus and the function of the lower esophageal sphincter are not altered by disturbances of function of the upper esophagus or of the cricopharyngeal sphincter. (*Authors' summary*)

1215. WENZEL, F., Ueber die Erkennungszeit beim Lesen. (On recognition time in reading.) *Kybernetik*, 1(1), 1961, 32-36.

The article studies the time it takes to recognize reading (a) in music and (b) in printed letters. (a) In diversified tests with professional pianists the playing speed is evaluated in one-handed key touches per sec. In the first test the playing speed depends mostly on the speed of reading, the mean recognition time of one note being 180-240 ms. In the second test the playing speed depends mostly on the speed of reaching the keys, with a mean recognition time of 400-500 ms. (b) Single letters are projected and read by 6 subjects; the time between projection and pronunciation is measured. Mean recognition time, from the start of the projection to the opening of the mouth is 160 ms; articulation time 85 ms; introductory breathing time: 45 ms; signal from eye to brain and brain operation time 200 ms. In reading of letter sequences the recognition time is 290-300 ms. (*B.Tb.T.*)

AUDITORY FEEDBACK

1216. MAHL, G. F., Sensory factors in the control of expressive behavior: an experimental study of the function of auditory self-stimulation and visual feedback in the dynamics of vocal and gestural behavior in the interview situation. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XII, 7.

This paper presents the results of two separate investigations. In the first, interviews were conducted in which young adults of both sexes spoke under four conditions: normal conditions, when they sat facing the interviewer but could not hear themselves speak because of a masking noise played through earphones, when they sat facing away from the interviewer but could hear themselves, and when they could neither see the interviewer nor hear themselves speak. Sequence and interview topic effects were controlled. The interviews were tape-recorded for subsequent examination. The interruption in the feedback of auditory self-stimulation produced a variety of effects including: (a) loss of normal intonation patterns, (b) the occurrence of unusual, idiosyncratic vocal "noises," (c) eroticized and aggressive laughter, (d) an increase in rate and quantity of speaking, (e) the spontaneous revelation of highly personal information, and (f) the expression of inhibited impulses and effects in verbal content and voice quality. These effects varied with the individual and showed adaptation in some cases upon repeated interviews. In certain subjects, the interruption in visual cues increased the masking noise effects. In the second study, interviews were conducted with additional young adult subjects of both sexes under normal conditions and when interviewer and subject both faced away from each other. Sequence and interview topic effects were controlled. Independent observers watching through a one-way mirror, evaluated the subjects' gestural activity. With the interruption of visual observation by the interviewer and feedback to the subject there occurred a decrease in communicative gesturing, but an increase in non-communicative, autistic gestures. Subjects' reports in the first study and palmar perspiration measures as well as subjects' reports in the second study do not support the hypothesis that the experi-

mental effects were a result of stress or anxiety. The findings of the two studies are interpreted to mean that the sensory factors investigated play an important role in the control of expressive behavior. The hypothesis is advanced that preconscious, critical, *actual* self-observation and evaluation take place as an integral part of this process of control—directly in the case of auditory self-stimulation, indirectly in the case of visual feedback from the audience. It is suggested that the normal functioning of characteristic way of controlling the expression of impulses and effects in speech and gesture depend partly upon the relevant sensory cues. (*Author's summary*)

COMMUNICATION THEORY

1217. ALLAN, M. D., Memorizing, recoding and perceptual organization. *Brit. J. Psychol.*, 52, 1961, 25-30.

This study reports the experimental investigation of the effects of overloading the human communication channel during a memory task. Subjects were asked to memorize the letters of the alphabet in a disordered sequence, and did so in four trials on the average. All subjects organized the material into more meaningful units such as license numbers, abbreviations, etc. Besides this "categorical recoding" of letter sequences into meaningful units, there was an "ordinal recoding" when these units were assigned positions in the total sequence. At the end of the first experiment, all subjects were able to recite the learned sequence in reverse, or to start at any point in the sequence and go backwards or forwards, without being forewarned. In a second experiment, the "whole" vs. "part" methods of learning were compared by having subjects learn the 26 letters in a total sequence, and then in five parts, consecutively. All subjects were successful using the "whole" method, none succeeded with the "part" method. In approaching the task, subjects reported frustration, and a desire to use the "part" method, although they went on to master the task by using the "whole," not the "part" method. Overloading the communication channel with a task beyond its powers of immediate absorption seems to bring into play a basic process of perceptual organization when the "whole" method is used. (*R.W.A.*)

1218. CARSON, D. H., Letter constraints within words in printed English. *Kybernetik*, 1(1), 1961, 46-54.

Due to the manner in which the English language is used, words exhibit strong internal constraints on letters, but some additional constraint may be imposed by the context in which words appear. In order to estimate the internal constraints of words and the overall effect of context, an experiment was carried out using 225 human subjects who predicted letters in each of the first four positions within words, both with and without context prior to the words. It was found that as more letters at the beginning of words are given, prediction of the following letters increases monotonically, but the increase is not smooth. Prediction of the third letter of words given the first two letters is only a little better than prediction of the second letter given only the first. This effect may be explained by the probable combinations of vowels and consonants at the beginning of words. Letters in the first two positions show no improvement due to long context but prediction of later letters is increased by such context so that prediction rises smoothly from the initial letter to the fourth letter. Also, the type of word in which the letters are to be predicted affects the prediction, function words showing more constraint on letters than content words. The difference between function and content words does not take effect, however, until the first two letters of the word are given. Using the prediction data from words preceded by long context, extrapolations of constraint out to the tenth letter were obtained. From the values of constraint at the first ten letter positions it was possible to estimate the maximum unilateral sequential constraint in English. A value of about 48% was obtained which compares with previous estimates of 50%. A further evaluation of the overall effect of context indicates that about 81% of the constraint in English is contained within the words themselves, and the other 19% is due to any additional context. (*Author's summary*)

1219. DULANY, E., Hypothesis and habit in verbal "operant conditioning." In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XVIII, 18.

It is not certain that verbal operant conditioning occurs without awareness or to what degree it is similar in process to operant bar pressing or disc pecking. In the first experiment, Ss said words ad libitum, and plural nouns were reinforced with "Umhhh." Those Ss showed a significant shift to plural nouns when compared with controls. Questioning revealed that approximately 25% of the experimental Ss hypothesized that whenever E said "Umhhh" they were to associate in series and that no acknowledgment meant they were to change categories. This group produced a highly significant learning trend, and the remaining Ss none. For the successful experimental Ss, then, an "associative hypothesis" tended to follow plural nouns and a "non-associative hypothesis" tended to follow Other Words. Neither questioning nor logic suggested the same distribution of these hypotheses for controls. With motivated Ss these hypotheses should be cues for responses; they should function as sets. If associating after plural nouns brings more plural nouns with a set to continue a series than with a set to find a new category, the present verbal reinforcement effect could be ascribed to the mediation of hypotheses that cue prior verbal habits. Experiment II presents a word association test with verbal reinforcement excluded. Frequency of plural nouns in response to plural nouns was significantly associated with a set to associate in series as opposed to a set to change categories. Other responses to Other Words was also found to be associated with these sets. There is a discussion of the implications of these findings for some of the reports of verbal operant conditioning and for the question of learning without awareness. It is argued that (a) learning by automatic strengthening and learning with awareness of the correct or correlated response class do not exhaust the explanations of a "learning curve" in verbal conditioning studies, (b) plural nouns in this study were not learned, with or without awareness, (c) the increase in plural nouns followed from an hypothesis that cued the transfer of a complex verbal habit, (d) this mechanism is a possible explanation of the verbal conditioning in several often cited experiments, (e) operant principles, as extended to verbal conditioning, do not account for differences in performance of

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those with and those without the critical hypothesis, (f) in constructing verbal conditioning analogs of experiments with infra-human subjects, we might well pay closer attention to the human subject's unique accomplishment—his use of language. (*Author's summary*)

1220. JOHNSON, F. C., and KLARE, G. R., General models of communication research: a survey of the developments of a decade. *J. Commun.*, 11, 1961, 13-26, 45.

Two conclusions can be drawn from a study of communication models in the 1950-60 decade. First, there have been great interest and much activity in diagrammatic models. This popularity may be because of the efficiency and the clarity with which they present otherwise complex verbal concepts. Second, and perhaps more important, most of the models related to Shannon's general communication have found his concepts as useful as his methods of presenting them. The most common modification consists of making some clear place for human behavior in the analysis. The 1959-60 decade has been one of many general communication models . . . however, the use of a diagram has nearly superseded the purely verbal presentation of a model. (*Authors' summary*)

1221. MATARAZZO, D., Verbal conditioning of two response classes. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section VIII, 29.

Purpose: To investigate such parameters in verbal conditioning as: (a) response class being conditioned (i.e., Are human responses and plural responses equally conditionable?), (b) influence of different examiners (i.e., Can one examiner crossvalidate the findings of another examiner?), (c) influence on verbal conditioning of such subject variables as age, sex, education, vocabulary level, Taylor anxiety level and total time to complete experiment, and (d) reliability of independent observer-scores in verbal conditioning. *Procedure:* (a) Experimenters: Two male experimenters were used; one a 33 year old psychologist, the other a 52 year old psychiatrist; both wore white coats during experiments. Es saw Ss in odd-even design, thus yielding an original and replication experiment for both

plural and human studies. (b) Human responses and Plural studies: Each E used same standardized instructions (in brief, asking S to "say words, any words at all will do, and there is no time limit"). Two observers, equipped with earphones, watched through a one-way mirror and independently, recorded Ss responses on a previously constructed tally sheet. (c) Subjects: 80 in all; for Plural experiment, N = 20 for E₁ and N = 20 for E-2; for Human experiments, N = 20 for E-1 and N = 20 for E₂; all Ss were (paid volunteer) college undergraduate students, both sexes; mean age 23. (d) Conditioning Procedure: Period I (Baseline), for first 100 words E said nothing; Period II (Conditioning), for next 200 words E said "Good" every time S gave the appropriate response; Period III (Extinction), for next 100 words E again said nothing. *Results:* (a) With "Good" as the reinforcement, neither E was able to condition plural nouns, while both Es were able to condition human responses. These results held both for group means as well as individual Ss. Thus, for these experiments, E was less important than was the response class being conditioned. (b) There was found to be no relationship between verbal conditioning and the earlier listed subject variables. (c) Observer-scorer reliabilities (36 Pearson r's in the three Periods of the four experiments) ranged from .97 to .99. (*Author's summary*)

INTELLIGIBILITY

1222. BLACK, J. W., Predicting the intelligibility of words. *Folia phoniat.*, 12, 1960, 260-272.

Predicting the relative intelligibility of English words is suggested as a method for the clinician and researcher to assemble words of differing intelligibility for the measurement of speech defectiveness. A study was made using two sets of words. Set I was a sample of 2,000 words, Set II 3,500 words. Both sets were drawn from the most frequently used 10,000 words in American children's literature. Phonetic recognition values are reported for selected consonants in terms of low, mid and high. Intelligibility is apparently related to "word-suggestion values" of two speech sounds. (*J.B.R.*)

1223. BLACK, J. W., Aural reception of sentences of different lengths. *Quart. J. Speech*, 47, 1961, 51-53.

An experimental investigation of the effect of varied lengths of sentences and varied conditions of noise upon listeners' identification of the words of sentences is reported. 15 original statements for each of eight word lengths from 3 to 17 words were contributed by three college graduates. The sentences were judged for naturalness and for the likelihood that a particular sentence might be expected to occur in speech or writing. On the basis of these criteria, 10 sentences for each of eight word lengths were selected and recorded by five male voices. The recordings were played to four groups of 48 listeners, half of whom heard the sentences in quiet and half at one of four S/N levels (10 db, 8 db, 6 db, and 4 db). Signal level for all sentences was 90 db re .0002 dynes/cm.² The listeners were instructed to write the last three words in each sentence. Analysis of the results revealed, in general, a decrease in correct identification of words with an increase in either sentence length or noise level. This tendency was greater when both conditions were present. (H.L.L.)

1224. DIEHL, C. F., WHITE, R. C., and SATZ, P. H., Pitch change and comprehension. *Speech Monogr.*, 28, 1961, 65-68.

The comprehension scores of matched groups on information delivered with (a) effective use of interval and inflection and (b) with all interval and inflection eliminated showed no significant differences. Ratings . . . were between "very good" and "good" . . . with normal interval and inflection, and close to "poor" . . . with all interval and inflection eliminated. (Authors' summary)

1225. WEBSTER, J. C., Effect of irrelevant information on information reception. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XIV, 1.

Tape recordings were made of pairs of one-syllable messages. Each message contained four bits of information, i.e., the message was either "ah" or "ee," was spoken by a male or a female, was in the left or right ear, and had a rising inflection (like a question) or a falling inflection (like a

statement). Four balanced series of 56 items each were recorded such that (a) in one series one message in each pair was in the right ear, the other in the left, (b) in a second series one was always spoken by a male, the other by a female, (c) one was "ah" the other "ee," and (d) one was a question, the other a statement. The rate of presentation of these message-pairs varied from one pair every two seconds to one pair every half-second. The listener's task was to make one decision, listen only to the left ear (or male voice, or "ah," or question) while ignoring the right ear; and three categorizations (if listening to the left ear only, was it male or female, "ah" or "ee," or a question or a statement, etc.). What irrelevant information is easiest to ignore? It is relatively easy to ignore messages (a) in the opposite ear, (b) by a voice of the opposite sex, and (c) of opposite vowel. It is difficult to decide between questions and statements. It is also easy to categorize messages as to which ear, sex, or vowel, but much harder to decide between questions and statements. In a sub-experiment half of the messages (at random) started with a "k" sound and half (at random) ended with a "t" sound. This "k" and "t" information was completely irrelevant as far as the listeners responses were concerned. In general those who had no difficulty with the original task were not bothered by the irrelevant k's and t's while those who already were in difficulty deteriorated further in performance when the k's and t's were added. (Author's summary)

PHONETICS

1226. BRONSTEIN, A. J., Some unresolved phonetic-phonemic symbolizations problems. *Quart. J. Speech*, 47, 1961, 54-59.

The variance in phonetic and phonemic symbols used by writers in phonetics, phonemics, linguistics, and speech has led to confusion on the part of many readers. Although some differences are merely for ease of printing such as /j/ for /dʒ/, other symbolization differences are the result of real differences of opinion. Five major areas of disagreement in the use of symbols are discussed: (a) the symbol /r/ and the sounds it represents, (b) the vowel structure of American English (particularly the disagreements concerning the number of

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different phonemes), (c) the "barred i" phoneme, (d) the schwa and caret symbols, and (e) the offglide forms of complex clusters. Further evidence is needed before decisions may be made concerning most of the items listed above; however, sufficient evidence is already available concerning the /r/ phoneme. It should be recognized that the /r/ does not behave like other consonants in American speech. It behaves much differently when prevocalic or postvocalic for many speakers. American phoneticians show preference for retaining the four vowel symbols [ɜ, ɜ̄, ə, ɝ] and the [r] for the consonantal position before and between the vowels. The "barred i" is becoming recognized as a separate phoneme by some writers. "The analysis of the available evidence points to these conclusions: (a) 'barred i' is a variant of /I/ for many speakers in certain words; (b) 'barred i' is a distinctly separate phoneme in the speech of many persons." (H.L.L.)

1227. FONAGY, I., and MAGDICS, K., Speed of utterance in phrases of different lengths. *Lang. Speech*, 3, 1960, 179-192.

The paper discusses the relation between the length of phrases and the speed of utterance. The material consisted of poems, tales, scientific and literary lectures, sports broadcasts, recordings of spontaneous conversations, and of the speech of children at the age of 5-6 years. The speakers were Hungarians. The speed of utterance varied with the type of material, ranging from 9.4 syllables per sec for reading poems to 13.83 syllables per sec in sports broadcasts, with an average of 11.35 sounds per sec. The length of phrases, determined by stressed syllables, varied from 2 to 35 sounds; the duration of phrases fluctuated between 45 and 272 centiseconds (csec), with a mean value of 78.3 csec. Speed was found to depend to a certain extent on the length of the phrase, shorter phrases being articulated at a slower rate of speed than longer ones. The relation between speed and duration may be expressed by the exponential function $y = a + be^{-cx}$. The duration of the sections into which the speech flow was divided by inspirations ranged between 117 and 854 csec, with an average of 321 csec for reading aloud. The duration of intervals between inspirations in mute breathing was much less variable, and averaged 339 csec.

The speed of utterance of expiratory sections was found to be entirely independent of the length of the sections. The increase in speed in the longer phrases was independent of the regularities of breathing. The authors explain the tendency to equalization as a manifestation of a psychological factor: the "order-principle" or the "repetition-compulsion," whose purpose is to free the organism from stimulation and restore it to a state of equilibrium. (I.L.)

1228. GORDON, M. J., and WONG, H., A manual for speech improvement. Englewood Cliffs, N. J.: Prentice-Hall, 1961. Pp 172.

This manual is for native and foreign speakers who wish to achieve standard American pronunciation and improve the rhythm and intonation of their oral English. English speech problems of students in Hawaii and Southeast Asia are emphasized. Functional knowledge of the structure of English and a reasonably extensive English vocabulary are bases for use of the manual which is aimed at speech improvement through listening, imitation, and conversational practice. IPA symbols are used and correlated with diacritical marks from three recommended dictionaries. The speech mechanism is explained in terms of movable and immovable articulators, and the vocal cords. Vowel and consonant sounds are classified and their production explained with schematic diagrams. The five essentials of standard English rhythm, including the intonation and melody patterns in common usage, are presented in units with practice drills. Problems involving confusing or difficult vowel, diphthong, and consonant phonemes are studied in units organized as to (a) formation of the sound, (b) spelling, (c) listening for recognition, and (d) pronunciation drills. Practice in the combined usage of rhythm, intonation, and pronunciation for effective communication in English as a second language is provided in the exercises at the end of each unit. (E.Y.Z.)

1229. ROTHMAN, R., Phonetic considerations in denture prosthesis. *J. prosthet. Dent.*, 11, 1961, 214-223.

The author discusses various speech sounds and the effects that dentures have upon the production of these sounds. The

importance of the tongue in its relation to the mechanism of speech production is emphasized. Factors of importance in the construction of phonetically accurate dentures include the correct vertical dimension, the occlusal plane, the contour of the palate, and the positioning of the anterior teeth. Patient education may be necessary in some cases. (A.K.K.)

SEMANTICS

1230. ERVIN, S. M., Cognitive effects of bilingualism. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XVIII, 20.

French-American bilinguals tell stories with predictably different themes in English and in French, when shown the same pictures. Differing categorization of perceived events, differing roles with audiences, and memory for different experiences in the two languages might contribute to this phenomenon. In studies of Italian-American and Navaho-American bilinguals, the memory explanation was explored. Bilingual recall of pictures was tested, with various languages spoken during learning and during recall. Differences in recall under these conditions appeared for coordinate bilinguals, who had learned both languages from monolinguals. Pictures easier to name in the more fluent language were recalled more often in that language. Best recall was learning and recall in the dominant language, and the worst was learning in the dominant language, and recall in the subordinate language. Pictures easier to name in the bilingual's less fluent language were recalled equally well in either language, but best when learning had occurred in the subordinate language. Thus it appears that in natural conditions, where material would be learned in the language most appropriate to it, there would be differential recall in the two languages. In the dominant language, there would be a tendency to recall material from the associated culture; in the subordinate language bilinguals would more often recall material from the other culture. The results can be explained by verbal mediation, or covert words linked to the overt ones. This process, found to occur in monolingual recall, has also been discovered to be important in categorizing or naming of

colors, and can account for semantic shifts in bilinguals. (Author's summary)

1231. GOSS, A. E., Verbal mediating (cue-producing) responses and the acquisition and use of conceptual schemes. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XVIII, 19.

The primary objective of this paper is the presentation of a theoretical analysis of acquisition and use of conceptual schemes wherein conceptual schemes are conceived as verbal mediating (cue-producing) responses and stimuli. However, experimental work on acquisition and use of one type of conceptual scheme is also described. A conceptual scheme is defined as any two or more sets of categories or variables that stand in ordinal, classificatory, or functional relationship(s) to each other. Briefly noted are some historical roots of analyses of acquisition and use of conceptual schemes. Bartlett's adaptation of the Kantian notion of *schemata*, and the Gestalt emphasis on organizing principles, are contemporary influences, particularly with respect to use of conceptual schemes. Functionalistic-behavioristic treatments of learning and stimulus-response analyses of concept formation which include mediating responses and stimuli are regarded as more important influences on at least the theoretical analysis proposed in this paper. Also noted, both generally and in terms of data for a particular conceptual scheme, are problems of the acquisition of conceptual schemes. The particular conceptual scheme is the Hertzprung-Russell diagram for the classification of stars. Finally, and in greatest detail, uses of conceptual schemes as verbal mediating responses and stimuli are analyzed. The first use is with respect to acquisition and retention of the stimulus-response relationships involved in characterizing particular objects or events which can be placed within conceptual schemes. Data on such use of the Hertzprung-Russell diagram are described. Also analyzed are the uses of already-acquired conceptual schemes as verbal mediating responses and stimuli in acquisition and retention of the stimulus-response relationships of two kinds of subsequent modifications of conceptual schemes: changes in functional relationships and inclusion of additional sets of categories or variables. (Author's summary)

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1232. **OSGOOD, C. E.**, Cross-cultural studies of meaning systems. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XVIII, 3.

Comparisons across cultures, despite differences in languages, are feasible for material traits like the making of pottery, but extremely difficult for most non-material traits like attitudes, values, and meanings. In fact, if the linguistic relativity hypothesis (cf., B. L. Whorf) is taken at face value, such comparisons are impossible. It will be my main thesis to suggest that such relativity holds for the denotative aspects of language (arbitrary rules of usage) but not for the connotative or affective aspects of language (the nature and dimensionality of symbolic representational processes within language users). Techniques for measuring the effective meanings of signs have been developed at the Institute of Communications Research at the University of Illinois. Application of factor analytic methods has indicated the presence of several broad dimensions of affective meaning, e.g., evaluation, potency, and activity, which account for considerable portions of the total variance in meaningful discriminations. Cross-cultural and cross-linguistic comparisons between Americans, Japanese, Korean, Greek, and several Southwest American Indian groups (Navajo, Zuni, Hopi) have already been made, and significant agreements in meaning systems have been found. Extension of this type of research to wider samples of world cultures and languages are contemplated. Demonstration of basic similarities in meaning systems, despite differences in culture and language, open possibilities for improved international communication and understanding. (*Author's summary*)

1233. **PATRINA, K. T.**, O ponimanii znachenii slova doshkol'nikami. (On the understanding of the meaning of words by children of preschool age.) *Voprosy psikhologii*, 5(4), 1959, 59-63.

A word has many meanings, dependent on context so that, when a word is presented in different word combinations, the word, having in each case a particular sense, will not be equally well understood in all instances. Utilizing 48 children of kindergarten age as Ss, it was shown that,

when given new lexical material, such children try to interpret the material on the basis of previous life and speech experiences; that is, they proceed from the word meanings which they already know. (*Psychol. Abst.*)

1234. **PORTNOY, M.**, Experimental manipulation of meaning. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XVIII, 17.

The modification of meaning in human behavior has explicitly and oftentimes implicitly been at the core of the parents' concern with child development, the educators' proposals for pedagogical procedures, and the psychotherapists' utilization of various therapeutic techniques. Nevertheless, it has been only in the relatively recent past that scientists concerned with the experimental investigation of human behavior have focused their attention upon this problem. One of the major obstacles encountered in this endeavor has been the problem of measurement. However, with the development of the Semantic Differential this obstacle has been overcome, at least in part. Using the Semantic Differential as a measuring device psychologists have begun to study meaning within the framework of known theories of learning. This paper will be concerned with the author's research in the experimental manipulation of meaning and will be discussed from the point of view of reinforcement theory. Since a stimulus word gets its meaning, in part, because each time it is paired with another word the meaning of the response word is conditioned to the stimulus word, it is hypothesized that manipulating the meaning of an association to the word through the application of verbal reinforcements would also affect the meaning of the stimulus word. Secondly, according to the hierarchical structure of associations hypothesis, the appearance of particular associates to a stimulus word in the sequential series of an individual is a function of the strength of the association bond. In other words, in a continuous association design the strong associates will appear earlier in the sequence for an individual subject and the weaker ones will occur later. Hence, it is expected, that manipulating the meaning of the strong

associates, those appearing earlier in the sequence, will have a more pronounced effect upon the meaning of the stimulus word than the manipulation of the weaker associates. This hypothesis has been upheld in this study. Furthermore, it is commonly accepted in learning theory that the strength of the conditioning is, in part, a function of the number of reinforcements. We would therefore expect that the greater the number of reinforcements given an association word the more marked should be the change in the meaning of the stimulus word. This hypothesis has likewise been substantiated. The implications of these findings will be related to some practical situations where the development and change of meaning are crucial. (*Author's summary*)

1235. RIEGEL, K. F., and RIEGEL, R. M., The analysis of objective parameters in a word-recognition experiment. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XXI, 9.

The great interest in problems of social perception during the last decade stimulated some research on the influence of the objective characteristics of words and syllables on recognition thresholds. The study to be discussed is a further attempt at such analysis. Three suggestions will be made: (a) derivation of a multiple regression equation to predict recognition thresholds for words on the basis of their physical characteristics, (b) some special implications of the effect of word-frequency on recognition thresholds, (c) differential effect of objective characteristics of words on the perception of young and old subjects. The general goal of the research, of which the following study is a part, was to analyze differences in verbal behavior and perception between old and young subjects. 24 students from a vocational training school with an average age of 16 years were employed as well as 16 subjects above the age of 60 years, living in a home for the aged in Hamburg. The latter were comparable with the younger subjects in their former professional status. 50 German words were tachistoscopically exposed to the young and 22 to the old subjects. The words were selected from the stimulus words of five verbal tests described else-

where . . . (a) Originally, approximately 40 parameters were applied in order to estimate the recognition thresholds. The Pearson or point-biserial correlations of these variables range in absolute value from .111 to .656. The first refer to parameters like: *number of letters*, vowels, consonants, and syllables; *word-frequency*; different indices of the symmetry, repetition, and configuration of the letter sequences; sums of transitional probabilities of adjacent letters, etc. The latter correlations refer to the presence or absence of *prefixes*, suffixes, *concrete referents to the word*, etc. The multiple regression equation is based on those parameters above which have been printed in italics. (b) A relatively low correlation was obtained on the word-frequency and a high correlation on the classification of the words into those which refer to concrete objects and those which do not. These results and their deviation from earlier findings may be due to the following reasons: differences in reliability or recency of the German and English word counts, types of words used, skewness and kurtosis of the distributions. The results led to the conclusion that frequency of perceptual experience with the *objects*, rather than with their *names*, has the greatest effect on the thresholds. Since the acquisition of a language proceeds from concrete to abstract forms, this conclusion should be reflected in the correlations between the word-frequencies for different age groups and the thresholds. A very regular increase in the correlations from $-.530$ at the Kindergarten Level (Horn) to a peak of $-.617$ at about the third grade level (Rinsland) and down to $-.308$ at the adult level (Thurndike-Lorge) confirm this conclusion. The errors introduced by using American counts for German words seem of little importance since only comparison between the age-levels have been attempted. (c) The most marked difference in the perceptual habits of young and old people was revealed by a greater dependency of the thresholds for the latter on the word length. Older people seem to perceive their information in discrete and small steps rather than in "chunks." This interpretation is congruent with that of Welford, Birren and others. (*Authors' summary*)

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1236. ROSENZWEIG, R., Comparison among word association responses in English, French, German and Italian. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XVIII, 21.

It is now possible to compare word association responses in several languages, since equivalent sets of stimuli have been used. Responses to the Kent-Rosanoff list of 100 stimulus words have been gathered by a number of workers in America, most recently by Russell and Jenkins (1954). Responses to translations of the Kent-Rosanoff stimuli have been obtained in Italy (Levi, 1949), France (Rosenzweig, 1957) and Germany (Russell & Meseck, 1959). For each language we noted the primary response to each stimulus (i.e., the response given most frequently to the stimulus). When the primary responses of the four languages were compared, a strong tendency was found for primary responses to corresponding stimuli to be equivalent in meaning. In each language, the greater the frequency with which a particular primary response was given, the more likely was that response to agree in meaning with the corresponding primary responses of the other languages. In each language, the primary responses that agreed in meaning with those of all three other languages had about twice as great a mean frequency as the primary responses that did not agree with those of any other language. When the primary responses of a language were classified according to the number of agreements with primary responses of other languages, about one-fourth of the total variance of response frequencies was accounted for by the variance between classes. When both stimulus and primary response were adjectives, or when the response was opposite to the stimulus in meaning, there tended to be high agreement among languages. (The two categories, "adjective-adjective" and "opposite" had seven-eighths of their cases in common.) The results can be accounted for on the assumption that, across languages, similar associations tend to occur among words of similar meaning, regardless of differences in verbal forms among the languages. This assumption was supported by similarities between associations in Navaho and in European languages, for

39 Kent-Rosanoff items. Within a single language, the more a particular response tends to predominate in one sample of responses to a given stimulus, the more likely it is that the same response will be primary in another sample. If associative tendencies are shared among languages, then the more a particular response predominates among the responses to a given stimulus in one language, the more likely it is that a response equivalent in meaning will be primary in another language. (*Author's summary*)

1237. TANNENBAUM, P. H., Semantic judgments of color. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XVIII, 15.

The study to be reported consists of an experiment dealing with the semantic judgments of selected color stimuli by a sample of 200 subjects. The specific focus of the study was to test the relationship between the physical characteristics of these color stimuli with the connotative judgments they elicit. The color sample consisted of 52 color chips based on the Ostwald Color System. These were selected to represent a systematic variation according to the three main color dimensions of hue, brightness, and saturation. Subjects were exposed to these stimuli in random sequence and under controlled conditions of lighting and observation. Their task was to judge each stimulus on a set of seven-point scales which comprised a semantic differential form. The specific semantic differential scales were selected on the basis of previous factor analytic work to represent the three major isolated factors of evaluation, potency and activity. On the basis of these judgments, separate factor scores were computed for each subject, and then mean factor scores for each stimulus were computed across subjects. These mean factor scores were then analyzed with respect to the specified physical dimensions of the color stimuli. The analysis indicated a highly significant relationship between the hue factor and the activity dimension of the semantic space—the reds and yellows being at the active end, and the blues and greens at the passive ends. Further, within each hue there was a significant relationship between the brightness dimension and the potency

factor, such that the addition of black makes a particular hue to be judged more potent and the addition of white less potent. There was also a significant though less pronounced relationship between saturation and evaluation when appropriate controls were exercised on the variation due to the different hues and the different subjects. Implications of the research for further work in the area of communication by color will be explored. (*Author's summary*)

SPEECH AND LANGUAGE DEVELOPMENT

1238. BATTACCHI, M. W., Levels of articulation and verbal communications in children. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section VII, 15.

This is a sketchy account of a research on verbal communication that the Psychological Laboratory, University of Bologna, is performing under a more general plan. A figural pattern (6 black dots in form of a regular hexagon and a larger black dot placed at the geometrical center of it) was presented to three groups of children, each group homogeneous for mental age (I, 4 1/2 to 5 1/2; II, 7 1/2 to 8 1/2; III, 9 1/2 to 10 1/2), with the task "to tell me what you see." The experimenter was their teacher or kindergarten nurse. Records of children's communications were kept by the experimenter after each child, tested individually, had performed his task. The leading criterion of analysis was: which are the meanings . . . [structural features] that communications can convey to a normal adult listener, when abstracting from the source of communication (children) and from the actual pattern children reacted to? Our results take account only of the meaning conveyed, not of the linguistic choices made in actual speech. . . . 14 out of 29 in group I described the pattern barely as "dots;" their communication conveys the meaning of a collection of homogeneous elements anyway arranged. Perceptually it corresponds to the indifferentiated-whole step (texture) in Metzger's hierarchy of Gestaltauffassungen. In group II, 14 out of 29 communicated they saw "dots and-or with-one dot," this last specified by its dimensional differentiation ("larger") and/or its loca-

tion in reference to the other dots ("in the middle"); or inversely those ones were specified ("around"). Also five children of group I reacted in this way, and eventually without communicating dimensional or spatial articulation . . . group II communicated a dimensional and/or spatial articulation of elements which rather vaguely hints at the structural features of the pattern ("in the middle," "around"). A noteworthy portion (7) of group II described the pattern as "a star," "a wheel," "a blossom," i.e., as a structurally identified whole, not analyzed, however, into its elements. These responses cannot be accounted for by lexical endowment, for the words used are assuredly mastered by younger children, too. Group III children responded as group II ones, with the exception that, in the place of the unanalyzed structural whole responses, there was a tendency to describe structurally identified wholes, but adding dimensional and spatial articulation and specification of their elements. Nine out of 30 children described the pattern as "an hexagon-or a circle-of dots (eventually six dots) and-or with-a larger dot in the center." As a tentative generalization, younger children communicated an indifferentiated whole, intermediate ones a structural whole or an analyzed quasi-structural whole, older ones this same kind of structure or an analyzed structural whole. It is thus broadly reproduced, at the verbal level, Metzger's hierarchy of Gestaltauffassungen. . . . (*Author's summary*)

1239. CLARK, M. M., Teaching left-handed children. New York: Philosophical Library, Inc., 1961. Pp 44.

This small volume is an abridgement of an earlier report by the author, published in 1957. Findings of two surveys of the incidence of left-handedness in school children under 12 years of age in schools of Scotland are given briefly; also discussed are genetic aspects, developmental aspects of laterality, ambidexterity, the relation of left-handedness and stuttering, and a battery of simple tests useful in determining hand preference and ability. Covered in more detail are mirror writing, laterality and its connection with reading difficulties, common characteristics and problems of left-hand writing, and suggestions for training such children, to improve handwriting and

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1240. LENART, E., Verbal discrimination and adequacy of expression in children. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XII, 5.

The present study is concerned with the development of rather differentiated verbal skill which may be termed precision of expression. By this we understand the choice of the word with the most accurate meaning within a given context; i.e., the choice of the symbol which transmits the intended information with a minimum of distortion. The subject was approached experimentally. 360 school children between 11-14 years of age were given the task of completing a number of short printed texts in every one of which two gaps occurred. With each text three verbs were listed on the margin for choice; each of the verbs, if interpolated in any of the gaps, gave good sense in its immediate context, but for each gap only one of the three verbs was quite precise with regard to the wider context. An example: thunderstorms usually . . . much damage; yesterday's storm . . . much damage to the crops, "cause" and "do" being among the listed words. In all cases the verb had to be inflected, in the cited text for instance the first gap is filled adequately by "cause" (present, third person plural), the second by "did" (past, third person singular). Hungarian being an agglutinated language all forms of a verb are distinctly different and recognizable. The above arrangement allowed analysis of the children's performance in two respects; viz., with regard to lexical meaning and syntactic pattern. It was found that the verbs carrying the most precise meaning were employed less frequently by the 11-12 year old, more frequently by the 13-14 year old, showing thereby that in the age groups under consideration the feeling for subtler shades of meaning develops with maturation and growing verbal experience. With regard to syntactic pattern mainly two indices were taken into account, tense and number. Again, the use of the correct tense was more general in the higher than in the lower age group. As to number, it was found that the younger children were

prone to fall victim to the "atmosphere effect" of plurality or singularity—which ever was represented by the immediately preceding text—in a higher percentage than the older children. It is known that after having employed certain words the exigencies of sense, usage and grammar make some continuations more probable than others. . . . As a result of the study presented it is maintained that this thesis possesses a developmental aspect. (*Author's summary*)

1241. MEIN, R., and O'CONNOR, N., A study of the oral vocabularies of severely subnormal patients. *J. ment. def. Res.*, 4(2), 1960, 130-143.

Comparison of the oral vocabulary of severely subnormal patients with the vocabulary of normal school children led to formulation of a concept of communality of experience—that the influence of routine existence within the institution results in limitation of vocabulary concerned with individual interests and personal experiences. Research on which this paper is based constituted part of a doctoral dissertation. The authors evaluate the literature on speech sampling and oral vocabularies, describe methods used in their study, and analyze results. A hypothesis suggested by the study for further investigation states that the role of intellectual factors in the determination of individual differences in vocabulary size should be reduced in favor of the part played by life experience and possible influences of the cultural level of the home. A core list of words of 50% frequency or more in the oral vocabulary of severely subnormal patients is appended. (*Rehab. Lit.*)

1242. REED, H. B., Factors that influence the origin and learning of verbal concepts. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XVIII, 7.

The problems investigated were the effect of each of the following factors on the learning and retention of verbal concepts: (a) set, (b) length of series, (c) complexity of stimuli, (d) forms of presentation, (e) abstractness, (f) psychotic condition, (g) association, (h) hints, (i) frequency of supporting stimuli, (j) visual-auditory manual method vs. visual machine

method. A total of nine experiments was made involving about 42 subjects each, 21 control and 21 experimental, a total of 378 subjects. It was assumed that the learning of ideas could be investigated by observing the process by which a familiar meaning becomes attached to a symbol or syllable which was presented in controlled situations in which it would have but one meaning. The experiments on the first four problems have been published. They showed when a subject is told what a concept is, that the syllables represent concepts and that he is to find their meaning, he learned and remembered them much better than when he is told to learn the syllables. The learning time increases with the length of the lesson but at a decreasing ratio so that a series of 48 terms requires less than twice the effort of 24 terms. The learning time varies directly as the increase in complexity of stimuli. But, except short series, the form of presentation (simultaneous vs successive) makes little difference. The results of experiments on factors (e) to (j) inclusive may be briefly stated. The learning time of concepts varies directly with their degree of abstractness. Contrary to popular belief psychotic conditions outside of serious organic states and depressed manic depressive conditions reduce the learning time of verbal concepts very little. The origin of concepts occurs according to the laws of association. The process may be called one of controlled association. The subject looked for class names. Often such factors as similarity, contiguity, and frequency suggested class names which were tried. Hints were helpful to subjects in difficulty, and specific helps were more helpful than general ones. In general the frequency of acquired meanings was in proportion to the amount of supporting evidence, but a much more important factor was the consistency of the support, whether the meaning fitted all cases. Method of presentation, visual-auditory-manual vs. visual machine, made no difference. A more helpful factor was a logical method of approach based on a search for word meanings consistent with the instruction given. The uneconomical method was a non-logical approach based on associations of sensory quality and word position. (*Author's summary*)

1243. SIEVERS, D. J., Studies in language development of children using a psycholinguistic theory. In *16th International Congress of Psychology*. Bonn: German Society Psychology, 1960. Section XVIII, 6.

The present author attempted to devise a series of tests which would measure the various aspects of language in children according to psycholinguistic theory of communication first advanced by C. É. Osgood which states there are three processes in language: (a) decoding, (b) association and (c) encoding. This behavior also has three levels of organization: (a) semantic, (b) grammatical and (c) integrational. Two channels of transmission are included: (a) perceptuomotor and (b) auditory-vocal. From these, 18 facilities of language were hypothesized. Because these behaviors could not be manifested in isolation in a test situation, it was impossible to construct "pure" tests of each of the preceding facilities. Consequently 11 tests each of which involved several facilities were selected. They were (a) Labeling, (b) Mutilated Pictures, (c) Object Association, (d) Word Association, (e) Visual Form Tracing, (f) Gesture Sequence Matching, (g) Speech Sound Mimicry, (h) Nonsense Grammatical Mimicry, (i) Gestural Conversation, (j) Picture Series Description, and (k) Vocal "Cloze." The test battery was called the Differential Language Facility Test. Normative data were obtained on the test from a group of 228 average children between the ages of two and six. No significant differences were found between the means of boys and girls at any of the half-year levels on the total score for the Differential Language Facility Test. None of the subtests showed more than one age level with a significant difference between the means of the sexes. Age norms based on the median total scores of the combined half-year groups of boys and girls were presented for the total range of test scores from 5 to 227 with corresponding age equivalents of 1-9 to 6-7. Scores on the following subtests showed a linear growth function, relatively high correlations with CA, and high split-half reliability coefficients: (a) Labeling, (b) Mutilated Pictures, (c) Nonsense Grammatical Mimicry, (d) Visual Form Tracing, (e) Picture Series Descrip-

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tion, and (f) Vocal "Cloze." Object Association indicated linear trends with age but a low split-half reliability coefficient of .58. Negative acceleration was evident in the curve of development of Word Association. This subtest correlated highly with CA, and its split-half reliability coefficient was .86. The ceiling of the test was reached by the older age groups in Speech Sound Mimicry although it correlated .71 with CA, and its reliability coefficient was .92. Gestural Conversation did not differentiate between age levels; it correlated only .34 with CA; and its reliability coefficient was .48. The tendency for MA to correlate higher than CA in the subtests with verbal content was not significant. With the exception of the labeling tests, the intercorrelations among the subtests were relatively low when chronological age was held constant. A comparison of the performance on the Differential Language Facility Test of 33 non-brain-injured retarded and 30 brain-injured retarded with that of 100 normal children was made. It was found the normals tended to be superior to the brain-injured in overall language ability, and this appeared to increase with mental age. The normals were also higher than the brain-injured and non-brain-injured on subtests requiring vocal expression without semantic meaning. (*Author's summary*)

1244. STEGALL, C., *Linguistics and I. Elem. Eng.*, XXXVIII, 1961, 229-231, 263.

A teacher of English in the elementary grades describes in humorous fashion her initial rejection and later acceptance of "structural linguistics" as a basis for teaching English to children. She defines structural linguistics as "... the study of the natural and informal structure of oral language as used by educated people." The influence of certain professors led this teacher to change her methods of teaching English. "Instead of beginning with the book of pseudo grammar and proceeding to writing and then to speech, this structural linguistics cure begins at the base of the disease, speech and proceeds to writing and then—if need be—to grammar." (H.L.L.)

VOICE

1245. BREWER, D. W., and FAABORG-ANDERSEN, K., *Phonation. Clinical testing versus electromyography. Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 781-804.

Activities of the intrinsic laryngeal muscles [were] studied on the same patients on the same day by three separate techniques: (a) identification of major muscle imbalance by correlation of history and laryngoscopic findings; (b) clinical voice testing; and (c) electromyography. . . . Results indicate that healthy phonation basically is dependent on flexible balances of the inter-related sets of intrinsic laryngeal muscles. Unhealthy phonation or vocal abuse was regularly identified with imbalance of these same intrinsic muscles. . . . Based on clinical voice testing, it [was] demonstrated that the amount of activity of these muscles required to produce voice sounds can be measured clinically both qualitatively and quantitatively even in a single intonation. This new technique [was] termed clinical muscle activity assay. In single intonations the electromyographically demonstrated ratio between "resting" and phonation amplitudes measured in microvolts is directly comparable with clinical muscle activity assay. Of 75 intonations so studied, full positive statistical correlation was found. Clinical muscle activity assay can now be used as an additional clinical research tool to measure accurately the amount of vocal abuse occurring in each instance of imbalanced muscle activity in any individual voice. . . . A visual demonstration of divergence of function of thyroarytenoid and cricothyroid muscles [is presented], . . . [as well as] a demonstration of the activity of . . . the lateral cricoarytenoid muscle. . . . It has been found that by study of single intonations, electromyography is even more accurate than previously realized. . . . (*Authors' summary*)

1246. FIORI-RATTI, L., RICCI, G. B., and DE SANTIS, M., *Elettromiografia delle corde vocali. (Electromyography of the vocal cords.) Il Valsalva*, 36, 1960, 285-293.

On account of the well known difficulties inherent both in the routes of access and in the methods of recording, electromyography of the vocal cords has only been carried out in experiments on animals and on humans during operations on the

larynx. With the larynx intact, attempts have been made to obtain EMG recordings through the introduction of the electrode needle through the cricothyroid ligament. For the first time in this note a method is described by which the electrode is introduced into the vocal cords with the larynx intact through the natural routes with indirect laryngoscopy. The electrodes designed for this purpose are described, consisting of a needle 6 mm long, of 0.35 mm calibre, inside of which a platinum wire 0.20 mm thick is inserted, and insulated with "araldite." The electrode has an impedance (250-270 Ohm) higher than the usual capacity of ordinary electromyographs; thus it has been necessary to modify the input impedance of the amplifier by inserting a specially designed cathode follower; the signal passes through a two-way cathode tube, of which one path is used for the EMG and the other records the voice recorded by the laryngophone so that the lapse of time can be studied between the appearance of the action EMG and the emission of the voice (latent myophonic time). The authors describe the method that they have worked out and the findings obtained in normal subjects. There is also a discussion of the utility of EMG in laryngiatric and phoniatic practice and the diagnostic and prognostic situations in which it could be employed. (*Authors' summary*)

1247. HARTLIEB, V. K., LUCHSINGER, R., and PFISTER, K., Ein Vergleich der expiratorischen mit der inspiratorischen Stimmgebung mit Verwendung der differenzierten Klanganalyse. (A comparison of the expiration and inspiration process of phonation at different frequencies.) *Folia phoniatic.*, 12, 1960, 241-260.

The authors investigated with high-speed photographic and cathode-ray oscillographic techniques vocal fold vibration and the resultant sound-wave produced at low, middle and high frequencies. Voice on inspiration shows a shorter closed phase than does "normal" voice on expiration. As frequency increases the vocal folds become increasingly tense. A "dense" harmonic structure is "thinned down" to a single overtone upon transition from voice produced by exhalation to voice produced by inhalation. (*J.B.R.*)

1248. ULDALL, E., Attitudinal meanings conveyed by intonation contours. *Lang. Speech*, 3, 1960, 223-234.

Osgood's semantic differential was used to measure the attitude of listeners to a variety of intonation patterns. Sixteen pitch contours were applied by synthesis to recordings of four sentences, and 12 listeners (native speakers of American English) were asked to rate the patterns with respect to ten scales of the type "bored/interested," "polite/rude." A factor analysis was made to extract the dimensions of emotional meaning contained in the scales. As in Osgood's experiments, the "evaluative" or "pleasant/unpleasant" factor appeared strongest, accounting for more than 50% of the variance, followed by a much less prominent "interest" or "emphasis" factor, about 20%, and "authority/submission" factor, 8-13%. The second and third factors are equated with Osgood's factors "activity" and "potency." On the whole, contours of small range or small change of direction at the end were rated less strongly than those involving greater variability. Certain contours were found to carry particular weight with respect to some of the factors. For example, a narrow range fall from 200 cps to 100 cps was frequently rated most strongly unpleasant on all four sentences. The various kinds of tonal difference incorporated in the 16 contours conveyed different meanings on the different sentence types. The hypothesis is set up that the most nearly usual contours associated with a certain sentence type in a given speech community will receive "pleasant" or at least "neutral" ratings; in different speech communities, the various contours will be differently ordered. (*I.L.*)

SPEECH DISORDERS

APHASIA

1249. ALAJOUANINE, T., Baillarger and Jackson: The principle of Baillarger-Jackson in aphasia. *J. Neurol. Neurosurg. Psychiat.*, 23, 1960, 191-193.

The historical account of the debt owed to Baillarger by Jackson for the initial observation that aphasic patients can involuntarily pronounce words that they seem unable to say voluntarily is followed

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by the author's analysis of this condition. "... I have shown how striking is the evolution of aphasia in cases of progressive improvement as it offers another demonstration of the Baillarger-Jackson principle. During the regression of permanent verbal stereotypy one may note the increasing influence of the will. After the first stage where all voluntary speech is abolished and only a fixed and automatic verbal expression exists; later, as speech becomes more differentiated, the automatic utterance is checked by voluntary speech as the latter reappears. In agrammatism, which is often the end of such evolution, the same evolutive dissociation is found: voluntary speech shows agrammatism but ready-made or emotional automatic speech escapes such syntactic disorder. One could also demonstrate in the regression of jargon aphasia the substitution of voluntary influence for the loquacious, uncontrolled expression of these patients. A confirmation of Baillarger-Jackson's principle may also be found in the condition which may facilitate the uttering of deficient vocabulary: emotion is one of the most frequent of these features. The best example I had the occasion to observe was the case of an aphasic lady I examined in the presence of her daughter. When I asked this patient to tell me the Christian name of her daughter, she could not find it, and terribly upset, suddenly in a burst of emotion she said: 'My poor Jacqueline, now I don't know your name any longer!' The name she could not utter voluntarily appeared easily in circumstances of intense excitement." (J.D.S.)

1250. BARRY, H., *The young aphasic child.* Washington, D. C.: Alexander Graham Bell Association for the Deaf, Inc., 1961. Pp 71.

The purpose of this book is to acquaint the teacher, who may be uninformed about the child with aphasia, with some usable tools in determining the specific disabilities and educational needs of these children. The text is divided into three major sections: the problem, evaluation procedures, and training methods. The author devotes the largest portion of her writing to specific aspects of training. These are referred to as: impaired body image, impaired perceptions, figure-ground disturbance, spatial

disorientation, motor skills, language, reading readiness, writing, and number concepts. There are also case histories and progress reports included in the discussion. (N.E.W.)

1251. BENTON, A. L., *Right-left discrimination and finger localization: development and pathology.* New York: Hober, 1959. Pp 185.

Summarizes a series of studies by the author on the development of lateral orientation and finger gnosis. In addition, he discusses disturbances of the body scheme as encountered in adults, with the latter considered in relation to both focal and diffuse cerebral pathology. The principal conclusions are (a) disturbances in right-left discrimination involve a symbolic element and are, therefore, closely related to aphasia, (b) the localization of the Gerstmann syndrome is very probably less circumscribed than has been commonly assumed, and (c) further psychological analysis of disorders generally attributed to the body scheme is needed. (J.D.S.)

1252. BENTON, A. L., *Evolution and present status of aphasia theory.* In *16th International Congress of Psychology.* Bonn: German Society Psychology, 1960. Section XVIII, 22.

Three aspects of the development of aphasia theory will be considered—(a) description of certain behavioral phenomena as belonging to the category of aphasia, (b) determination of the neuropathologic bases of aphasia, (c) inferences regarding the psychopathologic processes responsible for the manifestations of aphasia. The knowledge of aphasia which existed in 1800 may be summarized as follows: almost all forms (complete motor aphasia, paraphasia, jargon aphasia, agraphia, alexia) had been described. The unawareness of defect which may accompany paraphasia or jargon aphasia and the coincidence of aphasia and agraphia had been remarked. Retention of capacity for serial speech within the setting of severely impaired spontaneous, conversational and repetitive speech had been described. Differential impairment in reading one language as compared with another had been noted. However, neither sensory aphasia nor the milder forms of syntactic aphasia had been described. That aphasia

was due to cerebral disease was recognized but no ideas about the localization of the responsible lesion had been advanced. The specific conception that aphasic disorders were due to an inability to associate images or abstract ideas with their expressive verbal symbols had already been formulated. The most notable development during the first 60 years of the 19th century is represented by Gall and Bouillaud who insisted upon a "localization" of language function in the anterior lobes of the brain (without regard to hemispheric locus). No important advances in clinical differentiation or in understanding of the essential psychopathology of aphasia seem to have been made during this period, although some excellent case descriptions enriched clinical knowledge. The picture changed completely with Broca's pathological demonstrations in 1861, which established the concept of unilateral cerebral dominance, raised the possibility of a "localization" of various aphasic disorders, and engendered an intense interest in the subject throughout the world. Wernicke's (1874) description of sensory aphasia and his demonstration of the importance of the dominant temporal lobe for language functions constituted a second major landmark. Many important developments took place following the Broca-Wernicke discoveries. Clinical observation disclosed new forms of aphasic disorder; an intensive interest in localization, based upon naive association theory, was countered by the formulation of more adequate conceptions of the nature of the psychopathology of aphasia and of the interrelations of thought and speech in the disorder; the complex role of cerebral dominance was explored. Present knowledge of aphasia reflects these developments but many questions remain unanswered and some ambiguities remain unresolved. (*Author's summary*)

1253. BROWN, J. R., Some clinical aspects of aphasia. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 1214-1222.

The author discusses the following aspects of aphasia, with appropriate citations from the literature: (a) relationships between laterality of the lesion and handedness, (b) localization within the hemisphere of lesions producing aphasia, and (c) a general description of aphasic defects. (*P.A.Y.*)

1254. CASEY, T., and ETTLINGER, G., The occasional "independence" of dyslexia and dysgraphia from dysphasia. *J. Neurol. Neurosurg. Psychiat.*, 23, 1960, 228-236.

The relationship between the degree of impairment (if any) of reading, writing, and spoken speech has been examined in neurological cases. One case in which severe dyslexia and moderate dysgraphia were associated with only slight dysphasia is described. The improvement of this patient's performance on language tests is followed in detail over a period of nine months. A survey of 700 unselected neurological cases indicates that in only one case out of 35 showing some language disorder was dyslexia or dysgraphia found as the sole disability. However, when the degree of impairment was considered, dyslexia and dysgraphia, alone or together, were more severe than dysphasia in four cases. The implications of such occasional "independence" of dyslexia and dysgraphia from dysphasia are briefly discussed. (*Authors' summary*)

1255. MOSER, D., An understanding approach to the aphasic patient. *Amer. J. Nurs.*, 61, 1961, 52-55.

The immediate attention to adults with aphasia given in hospitals by nurses is the focus of this article. The stress is upon understanding the medical problem and its attendant language and speech difficulties, relaxing and encouraging the patient, and cooperating with the speech specialist. The nurse's manner is as important, if not more so, than what she says and does. Supportive general therapy is the keynote of the nurse's goal while waiting for or observing the technical speech assistance given under medical supervision. The point is made that the patient must be willing and able to accept speech therapy for benefit and progress. Additional points include stress upon the complexity of the condition, the patient's usual unwillingness to accept the limiting condition, and the danger of unperceived therapy efforts by nurses. (*L.E.C.*)

1256. SCHUELL, H., JENKINS, J., and LANDIS, L., Relationship between auditory comprehension and word frequency in aphasia. *J. speech hearing Res.*, 4, 1961, 30-36.

The Ammons Full-Range Picture Vocabulary Test, Form A, was administered to [one female and 47 male] aphasic patients before and after treatment. . . . Total errors on each of 83 words, and errors made by subjects on each quartile of the initial distribution, were analyzed for each test administration in relation to relative frequency of word usage shown by the Thorndike-Lorge General Count. Findings were (a) a significant gain was made between initial and final testing, (b) subjects tended to maintain the same relative positions within quartiles. The correlation between initial and final tests was .80, (c) relative frequency of word usage was an important factor in the ability of aphasic subjects to comprehend spoken words, [and] (d) gains made during recovery were related to both original performance level and word frequency. (*Authors' summary*)

ARTICULATION DISORDERS

1257. ANDERSLAND, P. B., Maternal and environmental factors related to success in speech improvement training. *J. speech hearing Res.*, 4, 1961, 79-90.

This study investigated long term effects of a kindergarten speech improvement program upon articulation in relation to socioeconomic level, certain maternal personality traits, and maternal family attitude factors. Seven mutual-control groups were established according to children's articulation and history of formal speech training. The Gordon Personal Profile, Parental Attitude Research Instrument, and a personal data questionnaire were given to 94 mothers who were evaluated on socioeconomic level. Results indicated that children in lower socioeconomic groups who participated in kindergarten speech improvement achieved articulation success approximating that of upper class groups. Improvement training also appeared to counteract negative effects upon children's articulation associated with high maternal Hostility-Rejection scores. A relationship seemed to exist between children's articulation and maternal scores in the extremes of a personality test, and cutoff scores were given. Effects upon articulation of maternal rejection, maternal adjustment, and of superior intelligence in the child appeared to warrant additional research. (*Author's summary*)

1258. SOMMERS, R. K., and FICHTER, G. R., Factors related to improvement under therapy when mothers are trained. *Penn. Speech Ann.*, 17, 1960, 52-56.

The relationships between articulatory improvement and certain maternal attitudes and environmental variables were studied. After children and their mothers attended a three and a half week training program, 88 mothers completed an attitude questionnaire. Speech improvement was computed from pre- and post-therapy phonetic analysis tests of 10 consonants in three positions. Most significantly correlated with improvement were mother's report of a change in father's attitude about therapy and the number of children in family (inverse relationship). (*A.J.B.*)

1259. SOMMERS, R. K., MEYER, W. J., and FENTON, A. K., Pitch discrimination and articulation. *J. speech hearing Res.*, 4, 1961, 56-60.

This study investigated pitch discrimination in school children with functional articulation errors in grades three through 12. A total of 65 subjects having articulation errors on either [r] or [s] were matched with a comparable group of normally speaking subjects on the basis of IQ, sex, and grade. The pitch subtest of the Tilson-Gretsch Music Test was administered to each subject following standard procedures. Children with functional misarticulations were found to be poorer in mean pitch discrimination than normals. No evidence was found of a difference between the group misarticulating [r] and the group misarticulating [s] on mean pitch discrimination scores. Matching variables of IQ, sex, and grade were found to be ineffective in increasing the precision of the experimental design. (*Authors' summary*)

CEREBRAL PALSY

1260. AMERICAN ACADEMY FOR CEREBRAL PALSY, Kernicterus and its importance in cerebral palsy. Springfield, Illinois: Charles C. Thomas, 1961. Pp 306.

The first session of the Eleventh Annual Meeting of the American Academy for Cerebral Palsy, held in New Orleans in 1957, was devoted to a symposium on kernicterus and its role in cerebral palsy. Discussions concerned the biochemical aspects

of erythroblastosis fetalis, the pathogenesis and pathology of kernicterus, and the clinical manifestations of the neurological deficits. The papers dealing with pathological studies of kernicterus were revised for this publication to insure greater comprehensiveness and more detailed analysis. Papers concerned with the physiological and biochemical aspects were completed in 1957. Throughout the discussions great emphasis was placed on preventive aspects of the condition. Contents: Mechanisms and significance of hyperbilirubinemia in the newborn with reference to kernicterus, Wolf W. Zuelzer and Audrey K. Brown. —Experimental and clinical observations on hyperbilirubinemia, Richard L. Day. —Pathology of kernicterus and posticteric encephalopathy, by Webb Haymaker (and others). —Pathogenesis of kernicterus in the light of its sequelae, N. Malamud. —Encephalographic and psychological aspects of the kernicterus child, Donald B. Lindsley. —Auditory deficits of the kernicterus child, William G. Hardy. —The clinical syndrome of kernicterus, M. A. Perlstein. —Ocular problems in kernicterus, Arnold Breakey. (*Rehab. Lit.*)

1261. CRUICKSHANKS, W. N., BICE, H. V., and WALLEN, N. E., Perception and cerebral palsy. A study in figure background relationship. Syracuse: Syracuse University Press, 1960. Pp 123.

This report of a three year research study presents information upon perception involving the figure background relationship in children with cerebral palsy. The study was made on a large population of athetoid and spastic groups of cerebral palsy children. A feature of the monograph is a report on the results of a visual tachistoscopic test: the Syracuse Visual Figure Background Test. Also fully described are the findings of investigations in the areas of visuo-motor perception, tactuo-motor perception, and kinesthetic perception. A control group consisting of 110 physically normal children is utilized for comparative purposes. A large number of illustrative graphs, extensive statistical treatment with appropriate tables, extensive review of related research, and complete description of tests used plus administrative and scoring details are included. (*P.W.N.*)

1262. EISNER, V., and SCHADE, G. H., Epilepsy in the classroom. *Elem. Sch. J.*, 61, 1961, 384-387.

Different types of epileptic seizures are described. Suggestions for school placement considering the nature and frequency of seizures are given. A discussion is given of what brings about seizures. Activities to be encouraged and discouraged are listed. Suggestions are made regarding care of the child in a seizure. The classroom situation is discussed in regard to reactions of fellow students and teachers. (*N.J.C.*)

1263. GOLDBERG, H. R., and FENTON, J. (Eds.), Aphonic communication for those with cerebral palsy. New York: United C. P. Assns, 1960. Pp 41.

Severe speech defects and incoordination of hand movements are the cause of many cerebral palsied children's inability to communicate through spoken or written language. The educational device described here, a conversation board experimentally tested in classrooms of a public school, a day clinic, and a residential clinic, uses a selected Basic English word list. Five graded boards, developed to meet the needs from preprimer level to adult level, are discussed and illustrated. Directions for construction of the boards and for their use in teaching language and number concepts are included. The Dolch list of basic words is given in the appendix. Five case studies illustrate usefulness of the device as a teaching aid and a motivating factor in the children's efforts to communicate. The adult board is one presently used by F. Roe Hall, who shared his experiences in developing and using the basic idea with the study group. . . . (*Rehab. Lit.*)

1264. GREWEL, F., Speech, language and hearing disorders in encephalopathy. *Folia phoniat.*, 12, 1960, 282-291.

The need to consider speech and hearing disorders in relationship to other encephalopathies (brain disorders) of children is presented. Symptoms of brain disorders in addition to speech and hearing include defects in intelligence, emotional and behavioral disorders, epileptic phenomena, and metabolic-endocrinological disorders. A thorough neurological examination is needed to provide a relationship to a specific cause and the possibility for the re-

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removal of the cause. Speech, if it develops, may offer the best assessment of the child's intelligence and future development. A team of speech pathologist, neurologist, audiologist, and others should consider the needs of encephalopathic children. (*J.B.R.*)

1265. NELSON, C. D., Subtle brain damage: its influence on learning and language. *Elem. Sch. J.*, 61, 1961, 317-321.

A discussion is presented of mildly brain-damaged children who display serious learning and adjustment problems and general disturbances in language expression. These children may display sequence difficulties or the inability to relate events of time or sequence. Familial language disorders are frequently present in the child's family history. Confused cerebral dominance is sometimes present as is perseveration. Writing and spelling disturbances are present. Most noticeable are lack of grammatical structure, omission of articles, conjunctions, prepositions, and other connective words, letter reversals, omissions, and spellings that would be correct if English were a phonetically consistent language. Poor sound discrimination and difficulty in abstract behavior are observed in some mildly brain-damaged children. Trained specialists working as a team should make special contributions towards understanding and training the child. (*N.J.C.*)

1266. ROBB, P., An introduction to the diagnosis of cerebral palsy and the use of a punch card record. *Canad. med. Assn J.*, 84, 1961, 651-657.

The purpose of this article has been twofold: Firstly, to provide a simple introduction to "cerebral palsy." It is emphasized that the term "cerebral palsy" is not a diagnosis, but simply a term to cover a multitude of conditions in children that result from abnormalities in the motor systems of the brain. Possible etiological factors are outlined. A classification, including type, site of involvement and severity, is given. Some of the associated defects are presented. Secondly, a punch card is introduced as a manner of indexing and to aid in the follow-up of patients. (*Author's summary*)

1267. RUSSELL, E. M., Correlation between birth weight and clinical findings in diplegia. *Arch. Dis. Childb.*, 35, (184), 1960, 548-551.

Of two hundred diplegics, those who had no upper limb motor involvement (88 paraplegics) had significantly better intelligence ($p < .001$) than those with upper limb involvement (112 tri- and tetra-plegics). Further, within each group, those whose birth weight was less than $5\frac{1}{2}$ pounds had better intelligence than those with larger birth weights. This difference was significant ($p < .001$) within the paraplegic group. Epilepsy incidence in the paraplegic group (9%) was less than in the tri- and tetra-plegic group (26.8%). Thus, patients with diplegia can be separated into two groups which probably differ etiologically as well as clinically. (*J.L.S.*)

1268. TOWBIN, A., The pathology of cerebral palsy. Springfield, Ill.: Charles C. Thomas, 1960. Pp 206.

This book is a culmination of the author's study "to correlate the occurrence clinically of cerebral palsy with the pattern of the disease as observed in autopsy investigation." The condition of cerebral palsy is defined in terms of its neuropathology, and causes of the neurological disturbances underlying cerebral palsy are elaborated. The author points out that the number of persons in our society handicapped by cerebral palsy is three times as great as the number resulting from polio. Thus cerebral palsy emerges as the foremost crippling agent in children. For many years the misconception that cerebral palsy was primarily due to meningeal hemorrhage resulting from birth trauma has lingered. Prevention of cerebral palsy, prognostication and progress in treatment are significantly dependent upon a clear understanding of the basic pathology. Excluded from the classification of cerebral palsy, in its strictest sense, are neurological diseases acquired after the age of two years, progressive forms of infantile brain disease such as Tay-Sacks or malignant gliogenous tumors, and primary lesions of the cord and peripheral nervous system. Included in the classification are neurological disorders which develop from systemic, local or developmental aberrations and which remain relatively static in the course of involved persons' lives. Classification in terms of pathology emerges in three basic groups: (a) cerebral palsy due to brain lesions resulting from a systemic disorder in the fetus or newborn infant, (b) cere-

bral palsy due to brain damage of local intracranial nature, and (c) developmental defects of the brain. The pathological processes and morphologies under each type of origin are elaborated in detail. A brief outline of these is given here. (a) Systemic disorders give rise to anoxia neonatorum; prematurity; erythroblastosis fetalis; and systemic septic states. (b) Local intracranial pathogenic processes result in mechanical intracranial injury (meningeal hemorrhage); circulatory disorders; thrombosis and embolism; and hydrocephaly. (c) Developmental defects of the brain (hereditary or induced) result in arrest of growth and differentiation as in cerebral hypogenesis and dysgenesis. In the last chapter, the author treats the ologophrenic triad of mental deficiency, epilepsy and cerebral palsy as nosological problems. (M.M.)

1269. WALLACE, H. M., MEINERT, C., DIETER, R., and BEARMAN, J., Cerebral palsy in Minnesota: method of study, prevalence, and distribution, Part I. *Amer. J. pub. Hlth.*, 51, 1961, 417-426.

The first phase of a statewide study carried on in 1958-1959 of patients with cerebral palsy in Minnesota is presented. The aim of the study was to determine the reported prevalence of cerebral palsy among children and adults in the state; to determine the geographic location of the patients; to portray a picture of the current status of the patients, and to make a plan for comprehensive services to meet the needs of patients with cerebral palsy. A prevalence of 1.3 cerebral-palsied individuals per 1,000 total population was found. (D.A.O.)

CLEFT PALATE

1270. MORRIS, H. L., SPIERSTERSBACH, D. C., and DARLEY, F. L., An articulation test for assessing competency of velopharyngeal closure. *J. speech hearing Res.*, 4, 1961, 48-55.

The 176-item Templin-Darley Diagnostic Test of Articulation was administered to 50 children with cleft palates, one group of 25 with adequate and one group of 25 with inadequate velopharyngeal closure. [These groups were matched for sex, age, intelligence, socioeconomic status and general physical traits considered to be important in speech production.] On the basis of obtained group differences the 43-item Iowa

Pressure Articulation Test was constructed for assessing adequacy of velopharyngeal closure in cleft palate speakers. The following conclusions seem warranted: (a) Articulation test items containing fricatives, plosives, and affricates are the best discriminators between speakers with adequate and inadequate velopharyngeal closure. (b) Position of sound element in the test word apparently has no differential discriminatory effect on the articulation performances of individuals with adequate and inadequate closure. (c) Cleft palate speakers with adequate velopharyngeal closure give essentially similar performances on consonant singles, two-element items, and three-element items, while cleft palate speakers with inadequate velopharyngeal closure have increasingly greater difficulty as the number of elements in the test items is increased. (Authors' summary)

1271. OLIN, W. H., Cleft lip and palate rehabilitation. Springfield, Illinois: Charles C. Thomas, 1960. Pp 194.

During Olin's association with the Department of Otolaryngology and Maxillofacial Surgery, University Hospitals, State University of Iowa, more than 1,200 cleft lip and palate patients have received treatment in the clinic. This monograph [is] based on the various techniques used in the clinic . . . The introductory chapter contains brief mention of the historical background, the formation of the American Association for Cleft Palate Rehabilitation and its objectives, the location of cleft palate teams or clinics in the United States and Canada, incidence reported in studies since 1864, theories on pathogenesis of the condition, and the classification scheme used by the author. Remaining chapters discuss feeding techniques, surgical procedures used in repair, general dental care, orthodontic treatment, and prostheses constructed for clinic patients. Spriestersbach contributed a chapter "The Oral Structures as a Speech Mechanism." Approximately 300 illustrations, drawings, and X-ray tracings . . . (Rehab. Lit.)

1272. SCHWECKENDIEK, W., Gaumen-und lippenspalenträger in der Praxis des Hals-Nasen-Ohrenarztes. (Cleft palate and cleft lip patients in the practice of oto-rhino-laryngologists.) *H.N.O.*, Berlin, 9, 1961, 103-106.

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Occasional malformations of the auricle appear in such patients. Middle ear inflammation is frequent. Since the Eustachian tube is usually open and food may enter the nose, an ear infection can easily result. The treatment after an acute otitis is difficult since air inflation is impossible because of the lack of closure between nose and mouth. If necessary, adenectomy should be performed since in talking more air does not penetrate the nose. Asymmetries and other deformities of the nose, even if successfully operated on in early childhood, return later on; therefore, only operations on the soft parts should be performed at an early age in order to facilitate development of the bony parts. In unilateral clefts the septum is often so curved that it lies at the bottom of the nose. Sometimes in the course of growth such septa become more vertical, therefore any operation should be delayed until the 16th year. The cleft palate should be operated on at eight months, and the lip four weeks later. The method used leaves a hole in the palate which is later covered by an obturator. Tonsillectomy should be done as indicated in cases without cleft and with the same methods. (E.F.)

DELAYED SPEECH

1273. HUNTER, H. E., *Reading methods and games for teaching the retarded child*. New York: Know Publications, Inc., 1960. Pp 64.

The author refers to this book as "a practical, specific, how-to workbook." It begins with a presentation of learning problems more or less unique to retarded children and a discussion of desirable activity on the part of parents, teachers, and schools in helping them learn to read. Attention is then centered on techniques of teaching that have proven useful. Among specific subjects treated are reading readiness, vocabulary building, phonics, teaching of word meaning, and teaching of left and right. A section is devoted to goals, methods, and materials for the trainable mentally retarded as distinguished from the educable. Part two offers a variety of materials including stories, games, drills, and devices for independent work. (E.O.)

1274. KUGEL, R. B., and REQUE, D., *A comparison of mongoloid children*. *J. Amer. med. Assn.*, 174, 1961, 959-961.

A study of 55 mongoloid children and their families was made; 34 of the children were kept at home and 21 were institutionalized prior to their first birthday. Motor skills and speech skills were acquired at a significantly earlier age by the children who were kept at home. Of children kept at home, 60% used sentences by the age of eight, while only 10% of institutionalized children used sentences by the same age. Family adjustment was considered good in 55% of all families where the child had been kept at home. Interpretation of data is difficult because milder cases predominated in the group kept at home. The authors suggest, however, that a second look be given to the growing trend among physicians to recommend early institutionalization. Many factors should be carefully considered before recommending institutional placement. There is no generalization which can be applied to all, or even to most, situations. (M.H.M.)

1275. LURIA, A. R., and YUDOVICH, F. I., *Speech and the development of mental processes in the child*. (Translation from Russian by J. Simon.) London: Staples Press, 1959. Pp 126.

In order to study the effect of speech on mental development, changes in speech and concomitant changes in mental processes were observed in a pair of five year old speech-retarded uniovular twins, otherwise normally developed, who were placed in separate but parallel kindergarten groups. The less dominant twin received special speech instruction so that the relative contributions of phonetic impairment and the "twin situation" to their speech retardation could be determined. The twins' self-sufficiency had necessitated little more than pointing or gesturing in the course of their activities. Consequently, only primitive speech which consisted mainly of exclamations interlocked with actions or concrete situations had developed. Referents for their few common words were diffuse, general, and interchangeable. Marked phonetic distortion was present. A peculiar, insufficiently differentiated structure of consciousness corresponded to the primitive speech. The twins could not detach words from their referents. Since they could not formulate the aims of their activities with the aid of speech, they could not subordinate activity

to this verbal formulation. Therefore, they could not master skills, organize complex, imaginative play nor engage in meaningful, productive activity. Intellectual operations were very limited. Even elementary classifying and grouping were beyond them. Marked improvement occurred within three months following separation. Both twins developed full-value practical speech when motivated by the need for objective speech. Their intellectual processes were perceptibly reorganized. Activities were accompanied by an abundance of speech, separate objects were related to a context, and meaning derived from verbal formulation was maintained to completion of a project. Stability of production and independence from extraneous influences developed concomitantly. The initial impression that speech comprehension was adequate proved erroneous. Receptive and expressive problems were parallel. Speech independent of visual stimulation or necessitating some intermediate action was incomprehensible. Discrete elements were not qualified by the general context. As objective speech developed, comprehension improved. Only the twin who received speech instruction developed a theoretical attitude toward speech appropriate for his age. Elementary discursive operations were accessible to him at the end of 10 months but remained inaccessible or poorly developed in the brother. Differences in favor of the twin receiving speech training were found in the percentage of speech transcending the bounds of the immediate situation, percentage of extended sentences, relating and elaborating simple stories, describing the content of pictures, detecting picture absurdities, classifying objects in categories independent of direct perception, identifying differences between objects, counting the number of words in a sentence and extracting them in order, differentiating a quantity different from the number of words in the sentence, discriminating between a word and its synonyms, and assessing grammatical correctness of sentences. (M.R.)

1276. SHERIDAN, M. D., Disorders of spoken language in young children. *Arch. Dis. Childh.*, 36, 1961, 11-16.

In this brief article, the author offers first her own definitions of language, speech, hearing, listening, interpretation, learning,

recognition and recall. With these defined, she then considers spoken language as communication between two minds. Factors which affect the acquisition of spoken language include the lack of opportunity to learn, impaired hearing, low intelligence, delayed maturation of the central nervous system, brain injury, psychogenic disorders, motor dysfunctions, and lesions of the peripheral speech organs. All but the last two factors are briefly discussed in the article. (J.L.S.)

1277. THORNE, B., The problem of the marginally deaf. *Volta Rev.*, 63, 1961, 133-134, 146.

"The term, 'Marginally Deaf,' is coined to describe children who are delayed or retarded in speech development because of a lack of auditory stimulation from their deaf-mute parents but who are at the same time, overly stimulated by the manual language of the deaf." The author does not think that all deaf parents handle their hearing children in this manner, but there is a group consisting particularly of first-born children who grow up where there is little verbal stimulation in the first 18 months and whose parents are shy of outside contacts. This paper includes a number of suggestions as to how this problem may be circumvented. Contact should be made with these parents early, in order that the children may be stimulated to normal speech development at a very early age. (J.B.M.)

DIAGNOSIS AND APPRAISAL

1278. BOONE, D. R., Relationship of progress in speech therapy to progress in physical therapy. *Arch. phys. Med. Rehab.*, 42(1), 1961, 30-32.

At Highland View Hospital, Cleveland, 153 patients with hemiplegia or multiple sclerosis received both speech and physical therapy; the possible relationship between progress achieved in speech and language functions and the degree of physical independence achieved after completing physical therapy was evaluated. In 74% of the patients no significant relationship was evident between rate of progress in the two areas. One implication of the findings is that it is not possible to predict by physical status alone those patients who will do well in speech therapy. Patients too physically

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or psychologically involved to profit from physical therapy are usually not good candidates for speech therapy. Among those who do well in physical therapy there is an approximate 50% expectancy of benefit from speech therapy. (*Rehab. Lit.*)

1279. IMRE, V. V., Sprachstörung und vegetative Konstitution. (Speech disorders and the autonomic nervous system.) *Folia phoniat.*, 12, 1960, 273-281.

The use of the "autonomic reactometer" developed by Hauswirth and Kracmar is suggested as a diagnostic aid and as the basis for therapy. It is reported to be possible with the apparatus to establish relationships between speech disorders and the response of the autonomic system. Stuttering and spastic dysphonia are among the disorders considered in the paper and reported in the bibliography. (*J.B.R.*)

1280. KASTEIN, S., and FOWLER, E. P., Jr., Differential diagnosis of children with communication disorders. *Folia phoniat.*, 12, 1960, 298-310.

The study presented suggests the need for thorough diagnostic evaluation of children with communication disorders. The special problem of the child who appears to have hearing, yet does not respond to testing, is considered. The close cooperation of the audiologist and neurologist is noted to evaluate the child. The use of adapted Goodenough DAM and Bender Gestalt tests in addition to the social behavior, speech and pediatric history is reported. (*J.B.R.*)

1281. KRATZMEIER, H., Die Sprachprüfung nach Maria Hess. (Maria Hess's method of speech testing.) *Neue Bl. Taubh.*, 14, 1960, 48-54.

Extensive review of Hess's book. Speech testing should have three phases: (a) preparatory, (b) actual technical procedure, (c) diagnosis, differential diagnosis, prognosis. The preparatory phase should have a general anamnesis and a special anamnesis, concerning speech development, speech environment, origin of defect, former treatment, consequences of defect. A personality profile should also be obtained. Actual technical procedures involve situational and functional testing of the speech apparatus, closed circuit functioning of the sensorimotor feed-back system, speech perception (testing hearing, seeing, tactile sense, musi-

cality, rhythmical perception, attention and concentration, general and verbal thinking), speech understanding, speech impulse, word-inventiveness and verbal form capacity, relation between thinking and speech processes, and inner language. Control of speech mechanism, with tests of the bodily activities in general and the speech production in particular are also part of the technical phase. Differential diagnosis consists in distinguishing the different speech defects from similar ones, e.g., in hearing defects between organic and functional, in aphasia between motor and sensory, etc. A prognosis for speech defects should be formulated very carefully; the author gives the approximate time of improvement for each defect mentioned. (*B.Th.T.*)

1282. MUÑOZ SOLER, R. P., Disfonias psicogenas. (Psychogenic dysphonias.) *Fono Audiol.*, 6, 1960, 169-175.

The author emphasizes the importance of a psychosomatic focus in approaching the dysphonias in general, and the evaluation as much of the somatic components as of the psychic ones which determine them. The diagnosis of a psychogenic dysphonia is on the basis of the direct exploration of the laryngeal function, complemented by stroboscopy and chronaximetry, and by the study of the history of the patient which always demonstrates a correlation between emotional situations or conflicts and the symptom. Among the predisposing factors are emphasized the constitutional liability of the larynx, the hypotonic mesenchymal terrain, thyroid dysfunction, and the hyperemotive structure or neurosis of the personality. From the psychodynamic point of view, aphonia can be correlated organically with the acute or chronic emotions, can be converted from a psychic conflict into somatic symptoms or constitute a pathoneurosis. That is to say, that the conversion is produced as the nucleus of an organic affection and annexes a psychic component. For the therapeutic focus it is important to know if the aphonia is associated with an adequately balanced personality or whether it is one of those conversion symptoms of a neurotic personality; in the first case one can attempt the removal of the symptom by phoniatric or psychologic procedures, leaving until later if possible the treatment of the personality, whereas in the second case it is necessary

to proceed with deep psychotherapy and not become occupied in the treatment of the symptom. Seven brief clinical histories accompany this paper. (*Authors' summary*)

1283. RUBIN, H. J., and LeCOVER, M., Technique of high-speed photography of the larynx. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 1072-1082.

The authors describe a new technique for taking high-speed motion pictures of the normal and abnormal larynx. The authors use a Wollensak "Fastax" WF-4S camera holding either 100 or 400 foot rolls of 16 mm black and white or colored film. This camera is capable of stop-start runs at speeds up to 8000 frames per second. The subject is in a stationary position, and an ordinary laryngeal mirror is employed for reflective purposes. (*P.A.Y.*)

LARYNGECTOMY

1284. CIMINO, A., and BERNICCHI, L., Rilievi di broncoscopia, broncografia e termometria tracheo-bronchiale nei soggetti laringectomizzati. (Observations of bronchoscopy, bronchography and tracheobronchial thermometry in patients submitted to laryngectomy.) *Il Valsalva*, 36, 1960, 319-335.

After dealing with respiratory physiopathology of both laryngectomized and normal individuals, in the light of the data given [in the] literature, the authors expound the results of their own observations in matters of bronchoscopy, bronchography and tracheobronchial thermometry in a group of laryngectomized patients. The most outstanding patterns observed are reported together with some pictures of tardy bronchectasia and some pathogenetic considerations on the morphology referred to. (*Authors' summary*)

1285. CIURLO, E., and OTTOBONI, A., La voce alaringea dei laringectomizzati. (Alaryngeal voice of laryngectomized patients.) *Minerva Otorinolaryngol.*, 10, 1960, 69-75.

The literature is reviewed and the morphologic and functional characteristics based on clinical and roentgenographic examinations performed in three groups of patients submitted for total laryngectomy before, during and after logopaedic rehabilitation are presented. The formation of a pseudoglottis, formed by a gross dumbbell-

shaped stricture, and the presence of an air chamber in the oesophagus which communicates with the hypopharyngeal air chamber through the new pseudoglottis were observed. (*Authors' summary*)

1286. DI CARLO, L. M., AMSTER, W. W., and HERER, G. R., Speech after laryngectomy. Syracuse: Syracuse University Press, 1959. Pp 184.

This study was designed to compare the breathing and speech coordinations of 15 normal and 15 laryngectomized speakers. Furthermore, the articulation and rhythm adequacy of the laryngectomized individuals was related to their intelligibility and speech coordinations. The following hypotheses were examined: (a) that the speech coordination of the laryngectomized would approximate those of the normal speaker; (b) that the quantitative intelligibility indices employed in this study would differentiate between the better and poorer laryngectomized speakers; (c) that laryngectomized speakers who would be judged to be most intelligible would continue to employ breathing and speech coordinations more like the normal than do those who would be judged to be less intelligible. Finally the investigation purported to gain an understanding of some of the predictive variables of intelligibility from the laryngectomized speaker. Subjects, instrumentation, materials, procedures, measurements and analysis, judged intelligibility of the laryngectomized subjects, and findings of the study are reported. (*P.W.N.*)

1287. GILMORE, S. I., Rehabilitation after laryngectomy. *Amer. J. Nurs.*, 61, 1961, 87-89.

Rehabilitation for the laryngectomy patient should include, in addition to speech retraining, social and vocational restoration. Economic problems and interpersonal relations with family, friends, and the general public compound the patient's difficulties. Preoperative instruction and counseling, participation in group programs, and activity in public education programs can aid recovery. . . (*Rehab. Lit.*)

1288. LEJEUNE, F. E., Sr., STASSI, W., and LEJEUNE, F. E., Jr., Review of the available literature on the larynx for 1959. *Laryngoscope*, 70, 1960, 1483-1522.

In this annotated bibliography of 108 references, 13 articles are devoted to the

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anatomy, physiology, histology and photography of the larynx. The remaining articles are classified under the headings of: diagnosis, foreign body, injuries, diseases, stridor, stenosis, anesthesia, surgery, laryngocele, benign tumors, and malignant tumors. Nine articles discussed under surgery for malignant tumors deal with surgical and rehabilitative technics for the preservation or restoration of voice. (R.G.)

1289. REED, G. F., The long-term follow-up care of laryngectomized patients. *J. Amer. med. Assn.*, 174, 1961, 980-985.

Because of factors of geography, distance, and difficulties of travel, it is often impractical for the laryngectomized patient to see the operating surgeon for more than occasional check-ups. The routine postoperative follow-up frequently becomes the responsibility of physicians who do not see or care for a large number of these patients. The author discusses the many problems peculiar to the laryngectomized patient including the following: the psychological outlook of the patient, family and physician; the care of the tracheostoma; the management of excessive cough, crusting, and mucous production; the problems of "colds" and loss of taste and smell; the management of subsequent anesthesia; questions regarding artificial voice production; the important factors to be observed to detect early recurrence. The author briefly describes the artificial and electro-larynges. He feels that artificial larynges, although efficient, have the great practical and psychological drawback of directing attention to the fact that the patient is unable to speak normally. Esophageal voice, on the other hand, although not sounding like a normal voice, is much preferable to the voice of the artificial larynges in that the resultant voice sounds more natural than that produced by artificial means and is available to the patient at any time, anywhere. The ability of the patient to talk without artificial means is of great importance in making the patient realize that he is a whole individual without serious limitations. Patients are discouraged from using the artificial larynges at first because most patients, if they find that they can speak with the little effort necessary with the various artificial larynges, will not have the drive and desire necessary to perfect

esophageal voice. When the patient's temperament, age, psychological make-up, etc., is such that he will never develop an adequate esophageal voice, he is counselled and assisted in obtaining an artificial larynx. The important thing in the voice problem, however, is not whether voice will be achieved by natural or artificial means, but that the patient be made to realize that in due course of time he will be able to talk. (M.H.M.)

STUTTERING

1290. ADLER, S., An integration of some research studies in stuttering. *Rehab. Lit.*, 22, 1961, 34-41, 53.

Presents research "which may be broadly classified as characteristic of stuttering." Incidence of stuttering is given for children, adults, Negroes, mongoloids, and psychotics. The view is expressed that "stuttering behavior is lawful in terms of learning theory and that the frequency of stuttering is attenuated when the conditioned cues that elicit [it] are partially extinguished." Research on such factors as grammatical structure, speech sounds, laterality, personality, heredity and environment are discussed. Other topics covered are motivation, sex differences, anxiety, motor development, and communication theory. The author draws his own generalizations from the research cited. "Obviously there is much disagreement among the studies. . . . It is highly probable, however, that many of these differences are due to procedural or definitional differences. . ." 93 references. (J.D.S.)

1291. HEJNA, R. F., *Speech disorders and nondirective therapy*. New York: Ronald Press, 1960. Pp 334.

This book, as the title indicates, is concerned with the treatment of speech disorders by the utilization of nondirective counseling techniques. The author has divided these techniques into two principal procedures: nondirective play therapy to be utilized in working with children and client-centered counseling which is recommended for use with adolescents and adults. The book has been divided into four major parts. In part one the author presents "the theoretical framework." General concepts are discussed and the rationale for utilizing the nondirective counseling technique with

certain speech disorders is presented. Part two of the book is devoted to nondirective play therapy. Its practical application to specific speech problems in considered and excerpts from recorded play therapy sessions are presented. In part three the author "summarizes the basic tenets of the non-directive or client-centered counseling process." Application of these tenets to those speech problems to which it seems appropriate follows. The fourth and largest section of the book consists of transcriptions of three different kinds of client-centered counseling interviews. The first portion of this division is composed of a series of transcriptions concerned with group interviews. The second portion contains transcriptions of three individual interviews taken at various stages during the therapeutic process; the first is an initial interview with a severe, college-age stutterer, the second was recorded during the course of therapy with another college-age stutterer, and the third presents an example of a therapy session during the later stages of therapy. The third portion of the last division of the book consists of transcriptions of 17 consecutive individual interviews between the author and a college-age stutterer. (C.D.P.)

1292. JOHNSON, W., *Stuttering and what you can do about it*. Minneapolis: University of Minnesota Press, 1961. Pp 208.

This is a book written for parents who are concerned about their children who stutter, for doctors, teachers, relatives and friends of those who stutter, and for stutterers themselves. The text is based upon long term clinical research. It includes discussions of how the problem begins, how the problem develops, how parents can help their child, how the stutterer can help himself and how the author learned to cope with his own experiences as a stutterer. The major focus of the writing is upon the basic causes of stuttering and suggestions for its prevention or alleviation. (N.E.W.)

1293. PEINS, M., *Adaptation effect and spontaneous recovery in stuttering expectancy*. *J. speech hearing Res.*, 4, 1961, 91-99.

The purpose of this study was to determine whether adaptation [to speaking situations] and recovery [from stuttering]

occur in the expectancy paradigm. An experimental group of 16 stutterers silently read a passage five times on each of four consecutive days and marked words they would expect to stutter on oral reading; a control group of 16 stutterers orally read a passage five times on each of four consecutive days. Both groups then read the passage aloud five successive times. An expectancy adaptation effect was not demonstrated, and thus no conclusions could be drawn concerning the validity of the explanations previously advanced for adaptation and recovery in stuttering. Evidence was obtained for spontaneous recovery within the expectancy paradigm only between days 1 and 2. (Author's summary)

1294. SHEARER, W. M., *A theoretical consideration of the self-concept and body-image in stuttering therapy*. *Asba*, 3, 1961, 115-116.

Previous authorities have noted the disassociation with self which occurs frequently at the moment of stuttering. This is viewed as a protective pattern and the stutterer thus has two self-concepts; one of the stuttering self, the other, the free-speaking, normal self. Therapy has been aimed at reconciling these two conflicting concepts. Another approach to therapy is to bring the stutterer gradually to a series of experiences which confront him with his stuttering self and then teach him to tolerate it without escape or avoidance and, finally, to manipulate it into a reasonable facsimile of the normal self. (S.H.A.)

VOICE DISORDERS

1295. ARNOLD, G. E., and PINTO, S., *Ventricular dysphonia: new interpretation of an old observation*. *Laryngoscope*, 70, 1960, 1608-1627.

Ventricular dysphonia "is caused by the faulty participation of the ventricular folds (false cords) in the act of phonation." It is explained "as the intrusion of a subcortical primitive mechanism of phonation after the regular cortical phonatory system had become inhibited by the unconscious aggressiveness of an imbalanced personality as a reaction to the threats of daily life." Six forms of ventricular dysphonia are listed, four of them developing as the result of organic disease of the nervous system or of

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the larynx. The mode of treatment depends upon the form of the dysphonia and may include vocal rehabilitation, psychotherapy, physiotherapy, local laryngeal procedures, and surgery. (R.G.)

1296. BRODNITZ, F. S., Vocal rehabilitation in a boy with esophageal voice. Clinical note. *Ann. Otol. Rhinol. Laryngol.*, 69, 1960, 1098-1101.

The case of a boy is reported who, at the age of four years, sustained a traumatic laryngo-esophageal fistula with subsequent partial destruction of the larynx and severe laryngeal stenosis. After plastic reconstruction of the larynx the boy had used esophageal voice for seven years. Revival of vocal cord phonation was achieved by the use of acoustic-vibratory sensations. The case is reported as an example of vocal rehabilitation through the teamwork of the laryngeal surgeon and the phoniatrist. (Author's summary)

1297. PEACHER, G. M., Vocal therapy for contact ulcer of the larynx. A follow-up of 70 patients. *Laryngoscope*, 71, 1961, 37-47.

A follow-up study of 70 patients who had received vocal therapy for contact ulcer was presented to determine the condition of larynx and voice in subsequent years. 65 had no recurrences of ulcers and 5 did. 61 had consistently clear voices, 2 had slight hoarseness, 6 had occasional hoarseness, and one had esophageal voice. 22 had occasional vocal fatigue. Factors relating to the length of time the ulcers healed were investigated. It appeared significant that 34 patients with operations healed on the average of six-and-a-half months while the 36 without operations healed on the average of two-and-a-half months. An emotional factor also appeared to account for some of those whose ulcers took longer in healing. Those without surgery were appreciably less symptomatic in terms of hoarseness and vocal fatigue than those with surgery. Etiologically, it is felt that contact ulcer is due to vocal abuse over a long period of time with breakdown at a finite time of extra emotional tension in work. Treatment consists of surgery only with massive ulcers in the presence of large granulomas and performed prior to vocal therapy. Dynamic psychotherapy from a psychiatrist is

recommended for a minor number. Superficial psychotherapy of reassurance and educative knowledge of the condition are sufficient for most. (Author's summary)

1298. SCHWARTZ, A. B., Congenital laryngeal stridor—speculations regarding its origin. *Pediatrics*, 27, 1961, 477-479.

Congenital laryngeal stridor is usually attributed to immaturity of the larynx, abnormally shaped larynx, laryngomalacia or congenital malformation. The hypothesis is given that congenital laryngeal stridor results from excessive rehearsal of the laryngeal closing reflex during the aquatic fetal life. A relationship between congenital laryngeal stridor and allergy is suggested. (N.J.C.)

GENERAL

1299. AINSWORTH, S. H., The profession devoted to speech and hearing disorders. *Asba*, 2, 1960, 399-402.

The various kinds of responsibilities that a group accepts when it attempts to be a profession are discussed. Examples of how the speech and hearing profession meets these criteria are presented. Various views may be taken of the field. One point of view is to consider it as a collection of types of the disorders with which it deals. This creates problems in that certain disorders appear to "belong" to various other professions. If the field is viewed from the standpoint of the clinical framework in which the work is carried out, this develops disagreements as to where this work should be done. The profession, on the other hand must be seen as serving all groups in all logical working situations. The effects of a communicative disorder and the processes for assisting a person who has one are the same regardless of the clinical setting in which this is done. If the individuals who have such disorders are to be served effectively it is important to look upon the clinicians who help them as belonging to an independent profession which can provide services in all appropriate places and in collaboration with other professions. (S.H.A.)

1300. AINSWORTH, S. H., The challenge of competence—Presidential Address, 1960 national convention of ASHA. *Asba*, 3, 1961, 3-5.

One problem has pervaded the speech and hearing field and is rapidly becoming crucial as it concerns competence of individual speech pathologists and audiologists. There is a trend for the image of the speech and hearing clinician to crystallize around those who have the minimal level of training. This is having a serious effect on the role of the clinician in various working situations. The two levels of certification now used by the Association have not been understood nor applied effectively. It is proposed that a single level of certification be established with standards high enough to enable the clinician to work independently. Concurrently it is recommended that a Master's degree be established as a minimum for membership. (S.H.A.)

1301. BANGS, T. E., Diagnostic training opportunities. *Asha*, 3, 1961, 35-38.

There is an increasing trend within medical centers to establish speech and hearing clinics which are designed to deal with persons who have communicative disorders complicated by or directly attributable to various neurological and physiological departures from normal. It is important that the speech pathologists and audiologists become oriented in such a manner that they can participate in such centers effectively. This can be accomplished by utilizing speech and hearing clinics which are located in medical centers as an adjunct to nonmedical university training programs. Extended statements by several physicians are presented. Experience by the student in such a center provides a wide and varied population for diagnostic purposes and provides contacts with numerous cooperative medical specialists. Furthermore, this provides for extended practice and the usage of diagnostic tools. (S.H.A.)

1302. BLOOMER, H. H., Rehabilitation of the adult with speech and hearing problems. *Asha*, 2, 1960, 431-434.

The speech clinician must be trained to interview, diagnose, treat, and consult regarding the speech problems of persons of all ages. He must perform these functions with reference to the manifold disorders of voice and articulation, language, and synergistic control of speech, as they reflect etiology attributable to environ-

mental, psychological, and physical circumstances. Since this activity demands more training and experience than most persons can acquire, some specialization is important. Six questions are asked involving the differences imposed by specializing in working with adults. Answers are discussed in some detail. (S.H.A.)

1303. BRIGHT, H. M., The therapist and the family physician. *West. Speech*, 25, 1961, 13-16.

Certain problems of communication involved between the speech therapist and the family physician are discussed. It is suggested that one important barrier to good relations with family physicians is a failure to recognize proper lines of communication and responsibility for medical care. Physicians may be made more aware of our services by providing talks to their groups and referring them to suggested reading materials. (H.L.L.)

1304. CHILDREN'S HOSPITAL MEDICAL CENTER, "Helping parents of handicapped children; group approaches." Boston: Author, 1961. Pp 40.

A report of an exploratory conference held for professional workers and representatives of community agencies, with the support of the Sarah T. Winthrop Memorial Fund. New avenues of approach to prevent the psychological and emotional complications that arise in families under stress because of chronic illness or disability in children were considered. The report contains papers given at general sessions as well as a summary of the closing panel discussion, reflecting deliberations of the workshop groups. Contents: "What are the needs of the handicapped child?" William Berenberg. "The psychiatric considerations underlying parental concern for handicapped children," George E. Gardner. "What can parents of handicapped children gain from group experience?" Aline B. Auerbach. "Community planning for parents of handicapped children," Leon Sternfeld. (Summary of panel discussion . . .): "Why parent groups?" "Preparation for group leadership." "Purposes of parent groups." (*Rehab. Lit.*)

1305. CLARK, R. M., Speech Pathology (Logopedics) in the U.S.S.R. *Asha*, 3, 1961, 43-45.

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The author visited the U.S.S.R. in the summer of 1958 with members of the Comparative Education Society. Speech pathology is discussed from the framework of general education, special education, preparation of defectologists and speech correction or logopedics. Organization of the work, the status and position of those engaged in speech correction, incidence of problems and some methods of treatment of certain speech disorders are described. (S.H.A.)

1306. CURTIS, J. F., Needs of an expanding profession. *Asba*, 2, 1960, 437-438.

This brief article is the statement given by Curtis at the Chicago Hearings of the Sub-Committee on Special Education of the Committee on Education and Labor, U. S. House of Representatives in May, 1960. There is substantial need for an expansion in college and university programs if the needs in the field are to be met in an adequate fashion. (S.H.A.)

1307. DUPUIS, R. M., The therapist and public school personnel. *West. Speech*, 25, 1961, 10-13.

Problems of communication faced by the speech therapist working in public schools are discussed. Because of the nature of speech handicaps, relationships with psychologists, medical personnel, social and community agencies, and special education personnel must be established. In the public school setting, efficient communication must also be maintained with principals, faculty members, and parents. The therapist must use terminology which will be meaningful to all concerned. He must be careful that his role is not misinterpreted. It is necessary that the integrity of the clinician be maintained so that others can predict what we will do or say. Suggestions for improving communication in case conferences are made. Training centers for speech therapists should become more cognizant of and responsible for developing the therapist's abilities to properly communicate with others professionally interested in our cases. (H.L.L.)

1308. GREGORY, H. H., State approval and accreditation of public schools. *Asba*, 3, 1961, 139-144.

In 1960 the Office of Education published a bulletin entitled "Approval and Accredi-

tation of Public Schools; Responsibilities and Services of State Departments of Education." This is summarized in such a way that it can be utilized and generalized to specific areas such as speech pathology and audiology. (S.H.A.)

1309. HALLOWELL, D. and SILVERMAN, S. R., Hearing and deafness. (Revised) New York: Holt, Reinhart and Winston, 1960. Pp 573.

This book is a revision of the 1947 edition. The chapter on military aural rehabilitation, which appeared in the earlier book, does not appear. A chapter describing the VA program in audiology is new. The book is divided into six parts: audiology, hearing loss, auditory tests and hearing aids, rehabilitation for hearing loss, education and psychology, social and economic problems. Part one has been added to by a statement relative to the distinctive but related tasks of the otologist and audiologist. Part two has been reinforced with a discussion on loudness. Also new is the inclusion of a Békésy and Rosenblith diagram on the axis of rotation of the malleus and incus and also Békésy's diagram showing direction of travel of waves along the membrane. A new chapter contains a discussion of definitions of terminology employed in the field of audiology. A chapter is presented devoted to medical treatment of hearing loss with an emphasis on conservation of hearing. Noise exposure, protective devices, and deterioration of hearing in the aging are discussed. Some modification of the discussion of surgical procedures has been added. Part three dealing with auditory tests and hearing aids has been expanded to include special auditory tests, military standards and medical-legal aspects. The discussion on hearing aids has been brought up to date. Part four dealing with oral rehabilitation is similar to the old book. Speech-reading is discussed. (P.W.N.)

1310. JOHNSON, K. O. and NEWMAN, P. W., Trends in the profession. *Asba*, 3, 1961, 109-114.

Early in 1960, ASHA conducted a study to determine the status and needs of professional preparation in speech pathology and audiology in colleges and universities of the United States. A total of 239 institutions indicated that they had a program

for professional preparation of specialists in speech and hearing disorders. The data from 193 institutions are presented in this article. This includes such information as the growth of the number of students at various levels of training, the number of students receiving degrees, the number with Advanced and Basic Certification, the types of speech and hearing disorders with which students are able to have experience in the training program. Various aspects of faculty, staff, and institutions are summarized in detail and in tables. (S.H.A.)

1311. LILLYWHITE, H., Toward a philosophy of professional behavior. *Asba*, 3, 1961, 39-42.

It is a paramount need of any profession to examine the members' behavior by which the profession is being judged. It is important to describe as clearly as possible the scope and limitations of acceptable, mature, dynamic, and professional leadership. After a critical and careful examination of this professional behavior it should be possible to formulate a philosophy of standards and ethics of high order. The professional organization can provide stability and direction in the establishment of a strong code of ethics. Several important questions that professional members need to ask of themselves are presented and discussed. (S.H.A.)

1312. LILLYWHITE, H., Organizing a hospital program for communicative disorders. *Asba*, 3, 1961, 139-144.

As a result of the attempt to treat the whole individual, hospitals of all types have come to provide facilities, personnel and programs for the diagnosis and treatment of many related problems of patients in order to treat specific problems more quickly and satisfactorily. This trend has resulted in establishing clinics for treatment and diagnosis of hearing, speech and language problems. The ailment for which an individual has been hospitalized may be directly related to his inability to communicate. Communicative problems are more than educational problems in that they are of concern in the total health of the individual. In the hospital it is often easier to develop the concept of team rehabilitation of the patients. Hospitals considering programs of speech, language and hearing reha-

bilitation may have various emphases; some diseases have a more direct effect on communication than others. The diagnostic problem is a major concern in this situation. Programs must be individualized and planned specifically to meet a particular situation. It is important that clinicians be certified if appropriate personnel standards are to be maintained. (S.H.A.)

1313. MAJOR, I., How do we accept the handicapped? *Elem. Sch. J.*, 61, 1961, 328-330.

What it means to get parents and teachers to accept the mentally handicapped child is considered. The problem of getting the child to accept his handicap is mentioned. Different meanings of acceptance are reported. (N.J.C.)

1314. MORLEY, M. E., Speech therapy in Great Britain. *Asba*, 3, 1961, 83-84.

The College of Speech Therapists was formed in 1944 as an amalgamation of two professional organizations. Its general organization and responsibilities are outlined. The relationships of therapists to the National Health Service and the effective control through the Ministry of Health are discussed. The legal basis for speech therapy has had effects on relationships to the medical profession. (S.H.A.)

1315. NELSON, C. D., The therapist and medical specialists. *West. Speech*, 25, 1961, 6-10.

Problems of communication between the speech therapist and medical specialists are discussed. Therapists are often unaware of differences in meaning of certain terms among various fields. Typical modes of communicating information about cases vary both with the field and with the individuals within the field. A lack of information about the nature and objectives of another professional field often leads to suspicion among specialists. The speech therapist in a medical setting is urged to devote more time to improving communication among fellow workers. It is suggested that efforts made to understand and accept the background of other specialists will be useful in reducing these communication barriers. (H.L.L.)

1316. NEWMAN, P. W., Speech impaired? *Asba*, 3, 1961, 9-10.

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hearing disorders as found by professional and lay groups, it appears that the attitudes of the two groups differ markedly. It is possible that decisions by specialists in the field give far different results than judgments made by lay persons. Various factors may affect the results obtained by the different survey methods. (S.H.A.)

1317. PALMER, M. F., Speech and hearing rehabilitation in Japan. *Asha*, 2, 1960, 403-406.

Dr. Palmer served as a consultant from the World Health Organization to the Japanese Ministry of Health and Welfare in 1960. The various laws under which programs could be developed and the problems facing the National Rehabilitation Center for the Deaf are discussed. Other institutions, schools for crippled children, training centers, etc. are described. A list of the recommendations made to the Ministry of Health and Welfare are provided. (S.H.A.)

1318. ROEHER, G. A., Significance of public attitudes in the rehabilitation of the disabled. *Rehab. Lit.*, 22, 1961, 66-72.

Failure to rehabilitate many disabled people arises not from "physical neglect or inadequate treatment resources but is much more deep-rooted in the negative attitudinal and emotional reactions of society toward its handicapped members." The complexities of the problem of negative societal attitudes are discussed and some proposals for modifying them are suggested. (J.D.S.)

1319. ROSEN, J., The community speech and hearing center as representative of the profession. *Asha*, 3, 1961, 117-120.

The special skills of the speech pathologist or audiologist have made him a valuable consultant to several medical specialties and other professions as well as for his primary responsibilities in the alleviation of the stress of speech and hearing disorders. The true clinical stature of the field will develop when our best representatives function cooperatively, but independently, with others who treat the disorders and handicaps of people. Various types of speech and hearing centers can provide this opportunity. The community center has particular opportunities for establishing

appropriate relationships with other professions. At the same time independence of action creates responsibilities. Although the diagnostic and therapeutic services of the center are primary, there are numerous secondary functions which may be undertaken by the community speech and hearing center. (S.H.A.)

1320. STAIGER, R. C., Language arts research. *Elem. Eng.*, 38, 1961, 175-186.

This is a bibliography of 312 research studies in the language arts as reported by respondents to a request of the National Council of Teachers of English and National Conference on Research in English. The studies are classified into 21 subgroups. In the areas of speech and hearing are the following subgroups: vocabulary, linguistics, bilingualism, speaking and speech correction, listening, and exceptional children. There are 16 studies listed under the subgroup title of "speaking and speech correction." The projects included in the bibliography were obtained by responses to letters sent to deans of graduate schools throughout the country. (H.L.L.)

1321. STEER, M. D., and HANLEY, T. D., Clinic-laboratory design based on function and philosophy at Purdue University. *Asha*, 2, 1960, 439-443.

There is a detailed discussion of a new speech and hearing clinical laboratory including diagrams of floor plans. Special equipment and costs for the center are presented. (S.H.A.)

1322. THELANDER, H. E., and PHELPS, J., Programming for children with a neurological deficit. *J. Pediatrics*, 58, 1961, 389-391.

A program for the child with a neurological deficit is given. The services of a speech therapist and an audiologist are necessary along with other professional services. Method of referral, admission routine, location of program, therapy and finances are discussed. (N.J.C.)

1323. U. S. PUBLIC HEALTH SERVICE, The central nervous system and behavior; selected translations from the Russian medical literature. Bethesda, Md.: Russian Scientific Translation Program, National Institutes of Health, 1959. Pp 1051. (Multilithed.)

The 70 translated articles collected for participants of the Third Macy Conference on the central nervous system and behavior, held at Princeton, N. J., Feb. 21-24, 1960, are representative of research in the related fields of neurosurgery, physiology, psychology, and psychiatry. In the field of speech development, for example, there are three articles by A. R. Luria, as well as an article by B. E. Sheivekhman on "Methods of Fixing Speech Habits Developed in Deaf-Mute Children Practically Deprived of Hearing." Since these articles are not normally available to American scientists unable to read the Russian language, the National Institutes of Health is distributing copies of the collection to medical libraries throughout the United States and Canada. (*Rehab. Lit.*)

1324. WAGNER, R. H., A parents' organization. *Volta Rev.*, 62, 1960, 396-401.

This paper briefly outlines the organization and development of local, state, and national associations for parents of retarded children. The author contrasts the problems of the parents of the mentally retarded with those of the parents of deaf children. He emphasizes many of the pitfalls and how greater cooperation can be obtained through parent organizations to help their handicapped children. (*J.B.M.*)

1325. WASSERMAN, C. S., and WAS-SERMAN, H., Health organizations of the United States and Canada: national, regional and state, a directory of voluntary associations, professional societies and other groups concerned with health and related fields. Ithaca: Graduate School of Business and Publication Administration, Cornell University, 1961. Pp 191.

This new health directory has been published by the Graduate School of Business and Public Administration at Cornell University. The work is claimed to be the first complete and up-to-date directory of voluntary associations, professional societies and other groups concerned with health, medical, hospital, pharmaceutical and related fields. This new bound volume lists almost a thousand national and regional

bodies and many hundreds of state-wide bodies. Details for each national and regional organization include address, names of principal officials, purposes and objectives, finances, programs and activities, publications, prizes and awards, meeting dates, affiliates, etc. A particularly important feature is the complete and detailed subject index of all the national and regional bodies. (*P.W.N.*)

1326. WEST, R. W., To our new members—Ave et Vale. *Asba*, 3, 1961, 6-7.

The ASHA is one of the national groups made up of persons who earn their livelihood in the same profession. This kind of grouping is part of the cultural characteristics of our nation. The profession is dedicated to support the beauty and efficiency of oral communication. The steps in the building of the profession and the association are reviewed. A suggested Hippocratic oath for the beginners in the profession concludes the article. (*S.H.A.*)

1327. WRIGHT, B. A., Physical disability—a psychological approach. New York: Harpers, 1960. Pp 408.

"The present volume is concerned with one segment of the relation between man and his physique, namely, the somatopsychological problem as seen in the disablement." An approach to this problem is given in terms of inferior and salutary status position, frustration and uncertainty, the changes in values necessary to the acceptance of a disability, the development of the self-concept, and the perception of interpersonal relations. Agewise, particular attention is given to the adolescent. Remedial measures are discussed with emphasis on the role of the parent in rehabilitation and methods of training the disabled in social skills. Case histories and research evidence are used throughout to illustrate points in the author's theory, with detailed accounts of attempts to motivate children in speech therapy and other remedial procedures. "This volume was written for the practitioner in the field of rehabilitation, especially for the professional in training . . ." 283 references. (*J.D.S.*)

Graduate Theses in Deafness, Speech, and Hearing, 1959

FRANKLIN H. KNOWER

Graduate schools of 48 colleges and universities in the United States reported 156 thesis titles in the area of deafness, speech, and hearing in 1959. Of these 101 were for Master's Degrees and 55 were for Doctorates. The titles are numbered below and alphabetized by school, type of degree, and author's name. The titles are then indexed by subject matter. Some titles are listed under more than one subject matter area. The Doctorate titles are indicated in the index by an asterisk after their numbers.

Titles

University of Arizona

M.A. Theses

1. Barker, J. O., A numerical measure of articulation.
2. Shogren, K. M., Comparison of the Barker and Wood methods for quantitative measurement of defective articulation.

Boston University

M.S. Theses

3. Hennes, J. D., The relationship between the semantic orientation of an individual and his oral comprehension.
4. Sunier, J. H., Stereophonic sound and its impact upon the communications industry.

M.Ed. Theses

5. Dorval, B. M., A descriptive study of a series of units on listening in fifth grade.
6. Messner, A. C., A comparison of certain language and non-language abilities among speech defective and normal speaking children.
7. Roffee, D. T., A study of personality traits of elementary school stutterers as revealed by the California test of personality.
8. Villeneuve, E. E., The development of pictorial materials for teaching the adult aphasic connected speech.

Ph.D. Thesis

9. Wallen, V., A comparison by Q-technique of the self-concepts of adolescent stutterers and non-stutterers.

Bowling Green State University

M.A. Thesis

10. Wormley, J., Perseverative tendencies in stutterers between the ages of seven and nine.

Brooklyn College

M.A. Theses

11. Schill, H. A., Variability of pure tone audiometric thresholds.
12. Malles, I., The effect of hearing aids on persons with unilateral conductive deafness.

Columbia University—Teachers College

Ph.D. Theses

13. Scholl, H. H., A study of the effects of aging on voice problems.
14. Stone, A. V., Henry Head: his work in language problems in aphasics.

Ed.D. Theses

15. Canfield, W. H., Handbook for parents of speech handicapped children.
16. Elwell, M. A., A language arts seminar for fifth year college students at New Jersey State College at Paterson.

University of Denver

Ph.D. Theses

17. Fitzpatrick, J., An investigation of the body image in secondary stutterers revealed through self-drawings.
18. Jacquot, W. S., An investigation into the hearing of brain-injured children for pure tone and for speech.

19. Vaughn, G. R., An investigation of the developmental aspects of certain language skills in a group of institutionalized mentally deficient subjects.

Emerson College

M.A. Thesis

20. Margulies, V. Y., Education for pre-school deaf children.

M.S. Thesis

21. DiRusso, I. B., The effect of the emotional climate of the home on the speech habilitation of the cleft palate child.

University of Florida

Ph.D. Theses

22. Battin, R. R., A study of the comparative effectiveness of two methods of presenting to parents information relative to speech and language development in the preschool child.
23. Dorne, W. P., The comprehensibility of the speech of representative sixth-grade Negro children in Lee County Schools, Alabama.
24. Knobelock, F. X. C., An X-ray study of unrepai red, complete cleft palate oral pharyngeal structures and their functioning during vowel phonation.

Florida State University

M.A. Thesis

25. Butler, J. A. S., Language as an instrument of goal-directed activity.

George Washington University

M.A. Thesis

26. Vaill, D., A description and evaluation of an experimental speech improvement program.

University of Hawaii

M.A. Theses

27. Bishop, S. C., A descriptive study of students with mandibular facet slips.
28. Rigdon, P. M., A survey of speech defects of selected tenth grade students in Honolulu, Hawaii.

University of Illinois

Ph.D. Thesis

29. Bettinghaus, E. P., The operation of congruity in the oral communication situation.

Indiana University

M.A. Theses

30. Davis, J. E., Jr., Visual discrimination of consonants in spoken nonsense syllables.
31. McClain, S. C., An evaluation of intensity and frequency patterns in pure tone screening audiometry.

State University of Iowa

M.A. Theses

32. Fifield, M. A., A study of some of the pitch characteristics of trained singers in speaking and untrained voices in speaking.
33. Goddard, L., A normative study of oral breath pressure in children.
34. Hadwiger, K. E., The relative effectiveness of four voice qualities in imparting factual information via audio-visual and audio-only media.
35. Moll, K. L., An investigation of the attitudes of mothers of articulatory-defective and speech-retarded children.

Ph.D. Theses

36. Brien, L. A., Phonetic elements and perception of nasality.
37. Stewart, J. L., The problem of stuttering in certain North American Indian societies.
38. Stoicheff, M. L., The effects of motivating instructions on the language performance of dysphasic subjects.
39. Winitz, H., A comparative study of certain language skills in male and female kindergarten children.

The University of Kansas

M.A. Theses

40. Stevens, W. E., A study of methods and materials used to correct articulatory defects in children.
41. Adriance, J. L., The use of the electro-lung as a diagnostic test of laterality.
42. Carnahan, D., A comparison of speech sound responses of objects in the pictures children do.
43. Maynard, A. J., A comparison of body image concepts of a group of cleft palate and normal children.
44. Stallcup, T. A., An investigation of speech discrimination in school children showing high frequency hearing losses.

Kent State University

M.A. Theses

45. Earle, F. E., A comparative study of the

results of parent education carried on with individual parents and groups of parents of post-operative cleft palate children.

46. Horner, J. S., An investigation of the relationship of auditory tone decay to speech discrimination in fifty sensorineural hearing loss cases.

Louisiana State University

M.A. Theses

47. Duck, G., A preliminary investigation of the employment of conditioned eyelid closure responses for the measurement of auditory thresholds in young children.
48. Lee, M. T., A study of attitudes of the American Association for Cleft Palate Rehabilitation on certain aspects of cleft lip and cleft palate rehabilitation.
49. Mooney, M. E., The comparison of abilities of normal and speech defective children to synthesize phonemes into words.

University of Maryland

M.A. Theses

50. Filbert, J. J., Discrimination of phonetically balanced words under two conditions of interruption.
51. Greenberg, F. I., The effects of side-tone delay upon the rate of speech of severely retarded children.
52. Hadlick, P. E., A comparison and a study of attitudes of speech therapists and teachers as measured by Minnesota teacher-attitude inventory.
53. Kubik, A. W., A study of speech handicapped third-grade children in twenty-six public schools of Baltimore County, Maryland.
54. McGranahan, L. M., A new approach to the measurement of the effects of delayed sidetone.
55. Postove, M. J., Selection of items as the basis for a test of speech-reading ability for adults.
56. Reddell, R. C., A comparison of the effects of three noise sources on the Doerfler-Stewart test results.
57. Reynolds, F. C., An analysis of five categories of classifications of word associations of fourteen adult aphasics.
58. Wolf, H. M., An investigation of relationships among measures of auditory memory span, auditory discrimination, reading achievement and articulation.

University of Michigan

Ph.D. Theses

59. Blakely, R. W., Erythroblastosis and perceptive hearing loss: responses of athetoids to tests of cochlear function.
60. Engleberg, M. W., Auditory matching as a procedure in the classification of voices.
61. Freeman, G. G., A preliminary study of screening items for the evaluation of children with speech defects.

Michigan State University

M.A. Thesis

62. Emerick, L. L., A study of the relationships between extensional definition of stuttering and attitude toward stuttering as manifested by some grade school teachers.

Mississippi Southern College

M.A. Thesis

63. Thomas, B. M., A comparison of the informational processing ability of children with articulation problems and normal children.

Mount Holyoke College

M.A. Thesis

64. Labelle, E. A., An investigation of public school speech and hearing programs.

University of Nebraska

M.A. Theses

65. Erickson, R., An exploratory study of the use of terminology related to voice quality.
66. Holt, D., A study of the relationship between velopharyngeal closure and observed nasality.
67. Roy, R., A study of the hearing acuity of a group of institutionalized mentally retarded adults.
68. Samuelson, D., The auditory acuity of a selected group of people with reported auditory hallucinations.

New York University

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69. Klinger, H., The effect of stuttering upon audience comprehension of speech.
70. Schneiderman, N., An investigation of the

factors affecting the judgment of pitch placement of defective voices.

71. Sokoloff, M., The effects of group play therapy and individual speech therapy on the communicative skills of non-dysarthric cerebral palsied children.
72. Tureen, J., An investigation of the relationship between defects of speech and reading achievement, including a study of the effectiveness of speech therapy on reading achievement.
73. Woolf, G., Acceptance and speech improvement—an investigation of the relationships of acceptance of self and acceptance of speech differentiation to progress in the correction of functional misarticulations subsequent to a program of speech therapy.

Northwestern University

Ph.D. Theses

74. Aufrecht, H., A comparison of the listening skills of sixty-five children with articulatory defects and a matched group of children with normal speech.
75. Fuller, C. W., A study of the growth and organization of certain mental abilities in young deaf children.
76. Graunke, W. L., Effect of visual-auditory presentation on memorization by children with hearing impairment.
77. Gregory, H. H., Jr., A study of the neurophysiological integrity in the auditory feedback system of stutterers.
78. Peterson, J. L., Masking by narrow bands of noise in various types of hearing loss.
79. Ruhm, H. B., Speech discrimination in low frequency noise.
80. Schendel, L. L., A study of the articulation ability of one hundred and two educable cerebral palsied adults and the relationship between articulation ability and selected factors.
81. Tillman, T. W., Masking by narrow bands of noise in normal and impaired ears.

Ohio State University

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82. Bottorf, B. O., An experimental study of the speech defectiveness of a group of slow learners based upon two scaling methods.
83. Creech, H. B., The duration of the syllable in oral reading.
84. Davis, G. D., A statistical examination of certain aspects of the hearing conservation program of the Ohio Department of Health.

85. Emanuel, M., An evaluation of the diagnostic value of an experimental test of auditory discrimination.
86. Mostoller, A. A., The effects of different sound pressure levels upon vocal tremor with special reference to cerebral palsied subjects.
87. Soderberg, M. K., An investigation of the level-of-aspiration behavior of hard of hearing and normal hearing lipreaders as measured by a lipreading task.
88. Stuerken, D-T. W., A study of unaided binaural speech, hearing and monaural pure tone measures of defective hearing subjects.

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89. Bell, E. S., A phonetic approach to the relative intelligibility and error responses among initial consonants and consonantal clusters.
90. Harms, L. S., Social judgments of status cues in language.
91. House, J. B., Temporal silence thresholds of hearing.
92. Nichols, A. C., An analysis of phonetic errors in identifying spoken syllables.
93. Soderberg, G. A., A study of the effects of delayed side-tone on four aspects of stutterers' speech during oral reading and spontaneous speech.

Ohio University

M.A. Theses

94. Clark, J. D., An analysis of clinical data on 1397 cases of hearing disability.
95. Kuenzli, G. L., An evaluation of certain intelligence test variables in children with impaired speech and normally speaking children.

University of Oregon

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96. Coleman, R. O., A comparison of children's responses to two methods of testing articulation.
97. Kelly, E. J., A stutterer's introspective analysis of his own stuttering.

Pennsylvania State University

M.S. Theses

98. Beltz, J. M. S., The relationship between binaural high-frequency hearing loss and misarticulation of (s).
99. Heller, A., The applicability of a system of content analysis to stuttering therapy interviews.

100. Hosted, P., The evaluation of four-year-old children's speech by parents, teachers and speech therapists.
101. Krautkopf, A., The relation between auditory monitoring and delayed auditory feedback reactions.
102. Needle, F., The effects of practice on PB and Spondee test scores.
103. Ross, F., Auditory figure-background relationships for speech hearing in the presence of speech among cerebral palsied and normal subjects.

Ph.D. Thesis

104. Dorsey, H., The relationship between performance of kindergarten children on a three-position and a deep test of articulation.

University of Pittsburgh

M.A. Thesis

105. Porter, A. L., A critical incident study of stage fright based on speaker observations of their own behaviors while speaking.

M.S. Theses

106. Fisher, J. C., An exploration of the relationship of functional articulation errors to speech intelligibility in children.
107. Heasley, M. H., Intensity generalization in clinical galvanic skill response audiometry.
108. Kohlruess, C. R., An investigation into the use of circumaural muffs in clinical audiometry.
109. Rogers, S. M., A study of the relationship between consonant sound discrimination and consonant articulation of twenty-two cerebral palsied males.
110. Savoye, A. L., The effect of the Skinner-Estes operant conditioning punishment paradigm upon the production of non-fluencies in normal speakers.
111. Weiner, R. H., A comparison of delayed auditory feedback responses of subjects at extremes of an extroversion scale.
112. Wilcox, E. M., The effect of speech improvement activities conducted by the classroom teacher upon consonant articulation of children in grades one, two, and three.

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113. Goehl, H., An investigation of aphasic verbal learning.
114. Giolas, T. G., An investigation of the effects of frequency distortion upon the intelligibility of monosyllabic word lists and a sample of continuous discourse.
115. Klim, C. J., A study of some variables pertaining to the ability of cerebral palsied children to understand speech.

116. Owens, E., A study of the effects of filtering upon the intelligibility of words varying in frequency of usage.
117. Shervanian, C. C., The speech developmental level of pre-communicative psychotic children.

Purdue University

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118. Sills, J. A., An investigation of the hearing environment of school-age hearing-impaired children.

Queens College

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119. Breudenberger, B., History of the Queens College Speech and Hearing Center from 1942-1956.
120. Gildsten, P., Stuttering and delinquency: a study of the possible relationships between repressed hostility and stuttering.
121. Marko, S., A survey of senior high school speech textbooks to discover amount and kinds of phonetic material contained within these texts from 1945-1959.
122. Ozaroff, S., A speech workbook for primary grade children with articulation difficulties based on a picture vocabulary from reading frequency lists.
123. Stalzer, B., A selection of written materials to be used by the speech therapist for correction of articulatory difficulties in children from kindergarten through grade eight.

University of Redlands

M.A. Thesis

124. Lipscomb, D. M., A study of the responses of children enrolled in a school for the deaf to the Bender Visual Motor Gestalt test.

Sacramento State College

M.A. Theses

125. Fong, R., The social competence of a group of young male stutterers.
126. Larson, D. E., A study of the attitudes of speech correctionists and classroom teachers toward stuttering.

San Diego State College

M.A. Thesis

127. Guigg, J., A comparative study of articulatory disorders in children.

San Jose State College

M.A. Thesis

128. Goraj, J., A study of the effect of a parent educational discussion program on the speech of selected kindergarten children with functional articulatory disorders.

University of South Dakota

M.A. Thesis

129. Lyle, F. R., A descriptive study of certain pronunciation patterns of a selected group of South Dakota students.

University of Southern California

Ph.D. Theses

130. Bargelt, H. J., An experimental investigation of the intelligibility of Japanese-born, American-speaking male college students.
131. Carver, W. F., III, An experimental study of the effects of interaural temporal delays and intensity differences on intracranial localization of Spondee words.
132. Gibbons, E. W., An experimental investigation of the Dichotic application of delayed sidetone and masking noise.
133. Kinstler, D. B., An experimental study of the role of covert and overt maternal rejection and acceptance in the etiology of stuttering.
134. Nuttall, E. C., An experimental investigation of repression of the auditory perception of disturbing words as indicated by verbal and electrodermal responses.
135. Steiner, G. E., An experimental study of the influence of subliminal cue words on an audience's perception of a filmed speaker.

Southern Illinois University

M.S. Theses

136. Carey, A. L., A two-year study of the effects of speech therapy on the scholastic achievement of fifty-one stuttering children.
137. Cozad, R. L., A Palmar Sweat Investigation of the relationship between anxiety and stuttering consistency.

Syracuse University

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